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for

July, 1936

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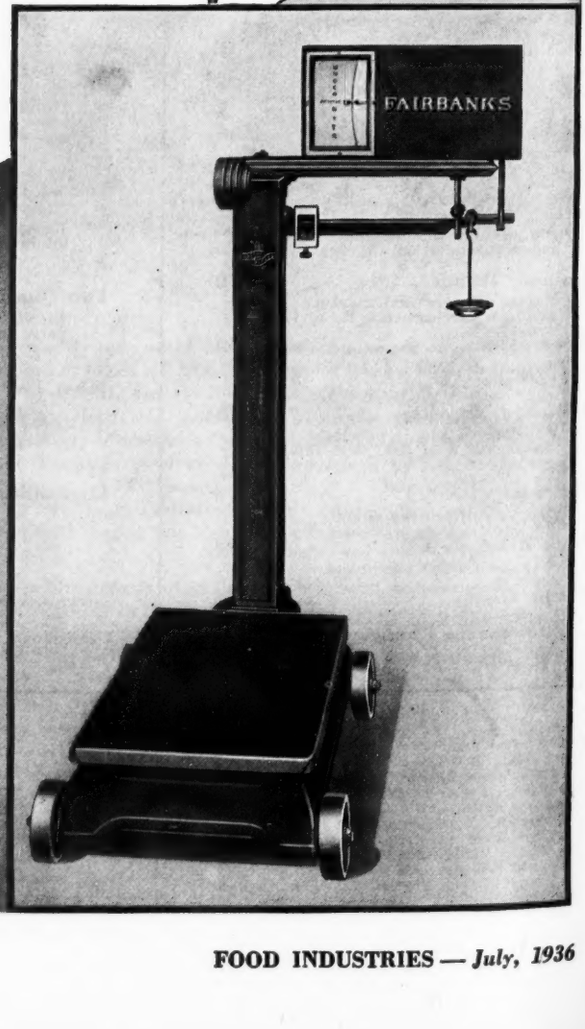

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FOOD INDUSTRIES

PRODUCTION • ENGINEERING • DISTRIBUTION

Established 1928—McGraw-Hill Publishing Company, Inc.

Vol. 8, No. 7

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Laurence V. Burton, Editor

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JULY 1936

THE TALK OF THE INDUSTRY

TEMPERANCE NOTE: We could not repress an audible chuckle when we read S.3950, a bill to appropriate $10,000 to help defray the expenses of the Sixteenth Triennial Convention of the W.C.T.U. to be held in this country in June, 1937. The bill has actually passed the Senate and in June was in the House.

A SHORT time ago, the Secretary of Labor, Miss Perkins, offered seven suggestions for giving employment to New England's jobless women.

These included the following: "(3) Development of a Low-to-Medium

Priced Canned Fish Industry to Meet the Needs in Areas Where Fresh Fish Is Not Easily Available"; "(4) Production of Novel Salt and Spiced Fish Products."

Speaking of the last named suggestion, which we strongly suspect includes Anchovies, Gefuhltefisch and Bismarck Herrings, she says that, if this new industry were developed to the volume of the imported fish specialties during 1932, it should offer wage earners on annual pay roll of $2,500,000.

The line forms to the right.

SOMETHING has got to be done to prevent the world from going any farther back into the Dark Ages. It slipped back a mile in May when somebody described the Pyjamas on a very desirable young lady as "Air Conditioned." It is slipping another mile this month.

A department store is actually advertising "Vitamin C Dresses." When that headline caught our eye, we recollected the fancy wisecracks of Billy Sunday (or was it Sam Small) who used to rant about ladies clothing that was "Cut V in the Back and C in the Front."

Vitamin C dresses, if you must know, don't come into that class at all. They button, all the way from the bottom up to the neck, and have all the delectable charm of a man in a business suit without any necktie.

NOW that the political conventions are out of the way, and political party platforms have been adopted, this department can settle back, with a modest degree of satisfaction, to our daily task. For one thing, we are thankful that it is not necessary for a technical publication, such as FOOD INDUSTRIES, to interpret, the maneuverings and political trends of the day. It would take too much of our time.

When politics can no longer be defined by its present American definition—the art of winning elections—and shall become the art of government, as politics is defined today in England—we shall be doubly grateful.

Until American political affairs begin to have a marked effect on American business, FOOD INDUSTRIES will have very few comments to make. To be sure, we have our own pet ideas of what ought to be, but we lack the necessary political acumen to put our ideas into effect.

BY way of illustrating what is meant by the foregoing statement of attitude, the failure of Congress to enact the new Food and Drug bill gives a good example. An overwhelming majority of food manufacturers in all lines are favorable to the enactment of the Copeland Bill. As it now stands, it is a fairly workable bill except for the part that calls for quality grades on labels. But even that section would not work undue hardship on most food manufacturers. In our opinion the real troubles would come to the United States Department of Agriculture when the definitions of the standards of quality would be put into force.

No matter where the quality grades are set, measured on an "absolute" scale of values, there are going to be a lot of manufacturers who will be left out of the picture in which they have been in the past. Somebody will be penalized. It will be unavoidable. And the next step will be to reduce the size of payments to farmers for raw materials. That, too, will be unavoidable.

Can't you visualize the next step? Farmers will complain to their Senators and Representatives. And then the Congressmen will be hot-footing

it over to the Food and Drug Administration to find out, How Come? Next will come the turning on of the political heat to get the standards of quality re-stated in such a way that the folks back home won't be left out in the cold.

RESEARCH is gradually removing the technical difficulties in the way of defining a grade. But no amount of scientific research will re-

move the political difficulties in the way of setting the standards. Quality grades on the labels are not wholly impossible technically. Of course, the matter of announcing the standards is only the job of sending out a few mimeographed pages. But enforcing those standards is where the real trouble lies. It cannot be done by sending out bulletins.

THERE will not be any new Food and Drug law until 1937. Outside of some vigorous opposition to the Copeland Bill, by industries that are not food industries, the reason why the bill has not been brought out on the floor for a final vote seems to lie in the political battle between the present Administration and Senator Copeland. Both Mr. Roosevelt and Mr. Farley were opposed to the renomination of Senator Copeland in 1932, but in spite of their efforts to prevent it, he was re-elected for another six years. He is now strong enough, politically speaking, to walk alone.

The White House wanted a new Food and Drug Law. Also a few other things, like the Tax Law revision. But Senator Copeland was re-elected in spite of the White House. And he packs quite a wallop in Congress. But, of course you get the idea—

A NEWCOMER into the publishing field is Consumers Union of United States, Inc., with Mr. Arthur Kallett, late of Consumers Research, Inc., as director. He, it will be remembered, was co-author with F. J. Schlink of "100,000,000 Guinea Pigs." Presumably those on the technical staff of C. U. are former employees of Consumers Research and all are members of TEOAU 20055 (Technical, Editorial and Office Assistants Union).

The first issue of "Consumers Union *Reports*" pays its respects to several kinds of consumers goods, including Breakfast Cereals and Grade A vs. Grade B milk. Evaporated Milk is to come next, and then hamburger and other meat products.

Consumers Union ties up with organized labor and publishes each month a list of manufacturers of consumers goods which, in the opinion of C. U., are unfair to labor. Goods are also rated as Best Buys, Acceptable, Not Acceptable, thus paralleling the C. R. "recommendations."

A membership in C. U. is entitled to a vote. A subscriber to C. R. has no vote. Salaries are made public. All members of the staff including the director were receiving $12.50 per week in May, an increase of $2.50 over the February rate.

We can hardly wait for the time when C. U. and C. R. begin to denounce each other. Incidentally, it would be very illuminating to know how much money Messrs. Kallett and Schlink made from "100,000,000 Guinea Pigs."

The Robinson-Patman Law

SOME food plants sell to big distributors under the manufacturer's own label. You have to be pretty fair-sized to do that. But you can be any old size if you are willing to sell under the distributor's label. All you have to do is have the right quality and be willing to accept the distributors' price. Or else be able to make them like your price, which is something rare.

So, the food plant superintendent who is most interested in the new Robinson-Patman law is in charge of a plant that sells big distributors under the manufacturer's label. He has been wondering how it will affect the profits of his plant. In the past, some superintendents have gasped at the low prices charged and the easy terms granted to big buyers.

Sales that give a special discount, an advertising allowance, and one case free with every ten, prepay the freight, and then allow 2 per cent for cash in ten days, bring the net realized-price down to a figure so close to the direct manufacturing cost that the work of making every car load is done for fun. Certainly not for profit. And we have even seen it done at a loss.

Will the Robinson-Patman Law change all that? Will it make it easier for a food manufacturer to make money? Not so that you could notice it. The law was not designed that way. It was designed to make these same delightful buying terms

Hors d'Oeuvres

• *Every so often a social-minded food manufacturer develops something to give the hard-working housewife another afternoon free for bridge. This time its Continental Mills, Inc., Seattle, which comes forth with packaged pie crust. You merely add water and apply the rolling pin.*

• The little girl of *New Yorker* fame who remarked, "I say it's spinach, and I say to hell with it," was wise in more ways than one. A committee of dental scientists reports that spinach must take a back seat to escarole, kale and parsley in vitamin-A value.

• *The salad days are here, the fruit and vegetable shippers tell us. Wonder if they mean what Cleopatra did when she referred to her less torrid days as her "salad days when she was green in judgment, cool in blood."*

• Beautiful and scantily clad women have been barred as attention arresters on billboards for beer by the Ohio Liquor Board. Really, now, the motorist who has his grand view of the city dumps obscured by a "commercial" is entitled to something.

• *A depressive mental attitude, drowsiness and even insanity has been cured in some cases by eliminating certain things from the diet. So says Dr. Walter Alvarez of Mayo Clinic. Maybe the Representative from Washington ought to lay off those "zippers."*

• Call Mr. James A. Farley what you will, we hand him a bouquet as a smart publisher. His "Book of the Democratic National Convention" had contracted, up to June 1, for advertising space costing $302,550. A long list of anti-New Deal manufacturers are among the advertisers. There are sixteen food companies.

• *If the cow cycle should ever run off the bottom of the chart and there develop a dearth of bovine beverage, never fear. A couple of farsighted scientists have developed a rat milking machine. These gentlemen have found mouse's milk to be far richer in protein and fat and to contain about half as much sugar as cow's milk.*

• If you think you have your troubles, consider the baker. He is told that he should bake a loaf like mother used to make. So he adds more and richer milk and shortening. Then someone says the new product can't touch the bread of the baker 20 years ago. So the baker takes out all the milk, reduces the shortening and reduces the punishment given the dough by yeast fermentation, heavy ingredients and high-speed mixing. Then the housewife complains that the bread won't toast properly. Twenty years ago that was of small consequence.

available to all comers. That's the theory. And a further theory is that the manufacturer will quit all the special generosity if it is costing him money, for he has to treat everybody alike.

Fine! In fact, splendid! However, there seems to be a fly in the ointment. All that anybody in commerce ever wants, is a "fair advantage." Big buyers have had their "fair advantage." Will they give it up? Do they need to give it up? Our guess is that big distributors will either get the goods at the advantageous price or else they will make more of their own. And, of course, the little distributor is now to get whatever advantage the big one gets, if he buys from a manufacturer.

Several courses are now open to food manufacturers. And plenty more are open to the big distributors. In fact, the new law is as full of holes as a fish net. We are cynical enough to believe that nobody will benefit by the new law. And the production department will not find any less pressure for low costs just because of its existence.

A manufacturer can go intrastate. Or he can choose his distribution outlets. Or he can tie up with some sort of cooperative movement. But cooperation can be practiced just as easily by distributors as by consumers. Our best guess is that the net result is an increase in the cost of distribution, commercial quarrels aplenty, and no good to the food manufacturer.

IT'S DOCTOR HARDEN F. TAYLOR NOW

Duke University awarded the honorary degree, Doctor of Science, to Harden F. Taylor, president of Atlantic Coast Fisheries Co., on June 8, 1936. Here's why: ". . . practitioner and organizer of biological research, scientist and inventor who has contributed largely to the technological development of one of our great food industries."

Opportunity

HERE is the food manufacturers' opportunity. In 1939 there will be a new World's Fair in New York, one which is planned to outdo the very successful Century of Progress Exposition recently held in Chicago. It is up to the food industries to do their part—to seize this opportunity to dramatize their services to the consumers of the nation.

At Chicago the transportation industries stole the show. They applied the very elementary principle that people will stop to gaze at other people at work. It's nothing else but the old story of a crowd watching a man digging a hole.

Did the returning visitors talk about the food industry exhibits? They did not. All that we ever heard was: the Ford exhibit; the Wings of the Century; the Sky Ride; Sally Rand; the Hall of Science; the aching feet.

People want action, movement, something going on. Static exhibits, pictures, dioramas may give the exhibitor a sense of self-satisfaction. But the people remember only the action.

When 1939 comes around there ought to be a number of well organized small food manufacturing plants at work all through the show.

We suggest a dairy, an ice cream plant, a macaroni plant, a bakery, a canning plant, a sausage plant, a coffee plant and a beverage plant—all working every day. Now is the time to lay plans.

The 36-Hour Week

SOME well-meaning but poorly-informed people were recently heard to discuss the 36-hour work week for labor with pay equivalent to the former 48-hour week as the cause of a certain food company's prosperity.

Such a notion unhappily omits all the other essential factors that contribute to the success of this ideal plan of operation. As any experienced manufacturer views it there must first be superb management; second, there must be a product of such excellence that it will please a tremendous market. Labor does not create formulas: that is a research and management function. Third, the volume of goods going into consumption must be huge and steady. Plant labor does not in itself create nation-wide demand. Sales and advertising departments plus excellent products do that. And fourth, but by no means least important, the plant equipment must be the best low-cost equipment used in that branch of the industry.

Adequate plant facilities, research and advertising appropriations and cash reserves depend on past profits —not on future profits. One cannot fire a boiler with the coal one is going to buy in the future. One cannot save the money as yet unearned.

Enlightened management can be expected to test out all the possibilities of cost reduction through shorter working hours when the foregoing conditions, which appear to be indispensible, are fulfilled.

To Production and Operating Men

BEGINNING with this issue there are a few changes in the arrangement of material appearing in FOOD INDUSTRIES. Operating men should read the blue section—it's yours. Comments on technical and factory operating matters will be found on the first page after the blue section. These will be followed by digests of important articles, discoveries and patents for men in operating positions. Next will come the short cuts and shop kinks in the Plant Note Book. And after them will come the New Equipment.

Milk Kept Fresh 42 Days By Vacuum Packing

By HOWARD T. GREENE
General Manager, Brook Hill Farm
Genesee Depot, Wis.

FROM the fruit and vegetable processing industry has come a method of packing which opens new possibilities in the marketing of liquid milk.

As applied to milk, the method provides for vacuum sealing of raw or pasteurized milk in a bottle by the vapor system developed by the White Cap Co., Chicago. Milk so packed was first exhibited at the Convention of the National Canners' Association last January. In the meantime the Brook Hill Farms has undertaken commercial introduction of vacuum packed certified milk to the Milwaukee market with promising results. Plans are being made to enter the Chicago, Kansas City, and St. Louis markets.

In application the system replaces the air in the top of the filled bottle with dry steam just before a gasketed metal cap is lowered into position over the mouth of the bottle. It then subjects the cap to slight pressure to assure closing of the bottle mouth. Finally, it causes a condensation of the steam in the top of the filled bottle.

By the vacuum so formed the metal cap, which replaces the commonly-used paper disk and hood, is held securely in place by the external force of atmospheric pressure. As long as the vacuum is not broken the bottle of milk may be laid on its side or stood on end for handling or storage purposes without fear of leaking or spilling of contents.

In addition to protection against spilling, several advantages are claimed for the new method of packing. First, tests show that milk packed in this manner will remain fresh for 48 hours at ordinary room temperature and that certified milk under refrigeration stayed fresh for six weeks at the University of Illinois. Second, the vacuum seal with a metal cap prevents tampering as well as accidental contamination of the milk by bacteria and dirt through air seepage or water soaking. Third, "cream plugging," or adherence of cream to the bottom of the milk bottle cap is avoided. And, besides protecting the lip of the bottle for pouring, this seal eliminates the possibility of the bottle closure being forced out in hot or cold weather through temperature changes.

To carry out the idea of a packaged product vacuum-packed milk may be marketed in a carton, Vacuum closed bottles may be laid on side or even stood upside down without danger of seepage or spilling.

THE manner in which the metal caps are applied under a vapor vacuum is quite simple. At our bottling plant in Genesee Depot the milk is handled and bottled on standard dairy plant equipment. But instead of sending the bottles to be sealed with paper caps or hoods—as we do for some of our milks—they are automatically routed to a conveyor which takes them to the vapor-vacuum sealer.

This unit consists essentially of a steam chamber through which a conveyor belt moves the bottles at a rate of 40 and up to 200 bottles per minute, a cap depositor, an overhead spongy rubber compression belt, and a water jet. In the steam chamber the tops of the bottles are subjected to an atmosphere of dry steam—steam superheated to 220 deg. F.—which to all practical purposes expels all the air from the tops of the bottles and leaves in its place a layer of steam. The bottles are protected from the steam by metal shields on the side of the steam chamber. They hold the steam close to the bottle top as it passes through the chamber.

While the bottles are still in this

> ▶ ***Through experience gained in the glass packing of processed foods the dairy industry has found a way of giving added protection to certified milk. Others who may find same advantages are glass packers of:***
>
> **Fresh fruit juices**
> **Maple syrups**
> **Cocoa syrups**
> **Fountain syrups**
> **Similar perishable liquids**

dry steam atmosphere they pass under the cap depositor which automatically releases a cap onto the mouth of the bottle. The function of the spongy rubber compression belt is to press the caps gently but firmly into place over the lips of the bottles so that when the bottles pass along under the water jet a positive vacuum will result as the dripping water condenses the small amount of dry steam in the bottle tops.

From this point on the bottles of milk can be handled as is ordinarily done.

The entire operation, from the time the uncapped bottle enters the steam chamber until it emerges capped and sealed at the other end, takes less than 30 seconds.

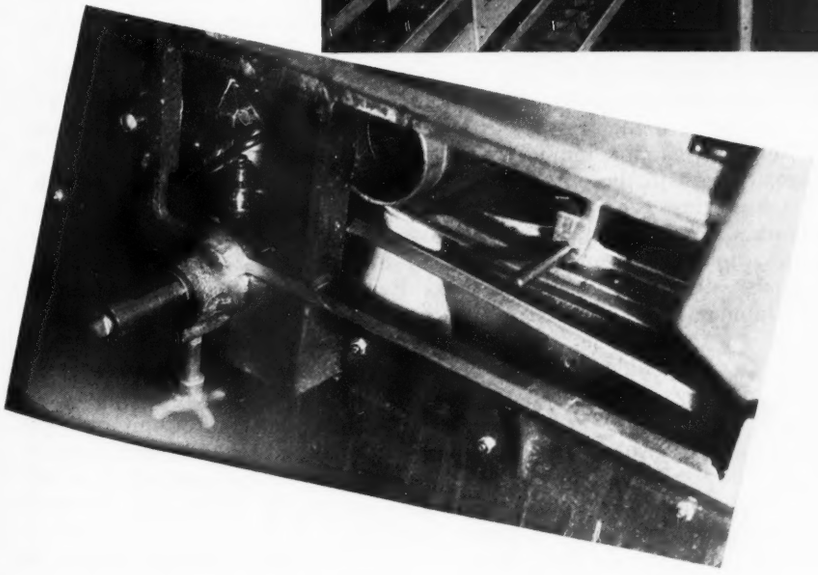
The metal caps are provided with edges rounded to fit over the lip of a milk bottle and have a rubber gasket on the inside to complete the seal. Their metal surfaces have been lacquered to prevent them coming into contact with the milk itself, a method of product protection similar to that used with metal containers for beer and acid foods. The cap is held in place by external atmospheric pressure, or air weight, of 14.7 lb. per sq.in. at sea level. The amount of vacuum within the bottle varies, of course, with the height above sea level. In locations where the pressure would not be strong enough to hold a top-seal in place, a side-seal cap can be used. With the side-seal closure the cap clamps around the lip of the bottle instead of over it.

To some extent we have found that the amount of foam in milk affects the amount of vacuum on account of the air in the milk coming to the surface. Among other difficulties which had to be overcome were errors in bottle manufacture. The lips of the bottles are not entirely smooth. This difficulty is being overcome by bottle manufacturers providing for a closer inspection on bottles and not passing for our use any with nicked lips or such imperfections which might be used with ordinary fiber caps.

THE cost of capping milk under the new method is at present about double that of standard methods for fiber caps, but within a short while it should come down. The machinery itself is comparatively inexpensive. The cost is largely in the metal caps themselves. However, the advantages the new method has over old methods have proved a valuable selling point for us.

A far reaching effect of the vacuum pack is that the ordering of a complete milk supply for a week in advance will be possible for the housewife. When kept under refrigeration vacuum-packed milk will stay fresh throughout the week.

At the present we are using the method only for certified milk and selling the milk in the Milwaukee market at no increase over former prices. Our other products are being bottled with standard fiber caps and hoods. We see in the vapor-vacuum process an added precaution in protecting our milk supply.



Bottles to be vacuum sealed move directly from standard dairy filling machine to compartment in sealing machine filled with dry steam. Lids sliding down feedways are automatically picked up and held loosely in place until firmly seated by rubber compression belt. Lower photo is a close-up of a section of the sealer showing one bottle about to pick up a cap and another bottle passing under the compression belt before reaching water jet which condenses the steam in top of bottle and creates the vacuum.

Cuts Production Time 45 Per Cent;

Temperature control, air movement control and

IF there ever was a branch of food manufacture that ought to be using atmospheric control in a big way, it is the macaroni and noodle industry. But most concerns in this field are not using it. Only a few plants out of the 200-odd units engaged in the business have been able to develop more than partial use of atmospheric control. Probably not more than ten concerns are in the group.

Some interesting explanations lie behind this curious situation. Probably one of the reasons why atmospheric control is not more widely used here is that the drying operation used in the manufacture of macaroni products is extremely difficult to carry out successfully.

It is an old story that any man who really, earnestly tries to master the art of drying macaroni will go crazy. But, though this is probably a slight exaggeration, it explains a lot.

Much of the trouble originates in something like a race that must be run between drying so slowly that the goods either mold or sour and drying so rapidly that the goods check or craze and fall to pieces. Air conditioning can solve the problem but, according to many who are in the macaroni business, it has not been successfully applied except in a very few plants. Indeed, in preparing for this part of FOOD INDUSTRIES' studies on controlled atmospheres, the advice was given quite freely that the wisest thing to do would be to drop the subject.

Admittedly it is a tough nut to crack. The proper conditioning of the air in some departments for the purpose of keeping the goods in the right condition is one thing. It is really true air conditioning (see p. 269, FOOD INDUSTRIES, June, 1936). But, then, there is the problem of drying the goods, also to be done in properly conditioned air, and that seems to be pretty much of a unit operation or manufacturing method. It is hard to tell when atmospheric control leaves off and when the unit operation of drying begins. One authority states that the failure to put macaroni-drying on a scientific basis in more than a few plants is explained by the fact that, at one time, some manufacturers of humidifying and temperature-control apparatus had attempted to install plants without a thorough knowledge of the special requirements of the macaroni industry. Many of these attempts caused such great losses in broken goods that the macaroni manufacturers became discouraged a few years ago. Consequently they still stay by the older methods of drying. These involve drying with ordinary air without any systematic or automatic attempt to regulate temperature or humidity, except by the use of a little steam in radiators or heating coils to "dry" the air when the humidity is exceptionally high in the outside air. In old-style drying, each dryer has a small window or porthole that is open periodically to let out some of the warm, moist air; and this creates a sort of chimney effect, draws in an equal volume of the less humid, cooler air from outside. And then the series of events is repeated.

IN spite of the chorus of the crêpe-hangers the fact is that, in the plants where air conditioning has been successfully used, some very worth-while gains have been made. (1) The drying time has been reduced from four or five days to 48 to 60 hours on the heavier, long-cut goods. (2) Molding and soured goods have been eliminated. If production time can be cut to less than half, and if spoilage can be eliminated, it is a goal worth shooting at.

According to the best information available, the ideal macaroni plant should include the following features:

1. Flour storage rooms should be air-tight and well insulated, and heated so that a minimum uniform temperature of from 75 to 85 deg. F. can be maintained even in the coldest weather. The reason for this recommendation is that during the winter months the semolina or flour becomes very cold while being shipped in box cars. If very cold flour or semolina is put into the mixers while it is still cold, the macaroni does not have as good color after it has been dried as if it had been warm at the start. It loses some of the golden color. Also there are some in the business who think that the cooking quality of macaroni, made in this way from cold flour or semolina, is not as good as that made from warm raw materials.

2. Press rooms should be constructed with tight walls and doors, and sealed windows so that the atmosphere can be under complete control. Adequate air-conditioning equipment should be installed for controlling the temperature, at will, anywhere between 65 and 90 deg. F.; and for controlling the humidity at will, anywhere from a 3-deg. to a 15-deg. depression of wet-bulb-temperature. And all this should be accomplished regardless of outside conditions.

Even though the foregoing specifications are so extreme that the equipment maker may gasp, the fact remains that nobody is certain about what conditions are just right. So, the ideal room will permit carrying high temperatures and high humidities, yet have the capacity to dry off the machinery when any moisture condenses on it.

Unfortunately nobody seems to

►***Atmospheric control under conditions suitable for use in macaroni manufacture, is not well understood nor widely used. Nevertheless there are similarities between methods of construction of drying rooms in macaroni plants and fermentation rooms in bakeries; also between press rooms in macaroni plants and proof rooms in bakeries. But the drying operation seems to be in a class by itself. So we conclude that macaroni makers can learn more from bakers than vice versa.***

Macaroni
Baking
Confectionery Manufacture

Controlled

Eliminates Spoilage 100 Per Cent

control of humidity at high levels can do this

Here is one of the earliest installations for really controlling the atmosphere in drying rooms of a macaroni plant. In the funnel shaped discharge pipe above the fan are located the heating coils to give the desired wet-bulb temperature depression. Spray chamber with windows and circulating pump at the rear.

know anything about the correct rate of air motion or the possible effect of insulating the press room on the need for air movement.

With a press room equipped like the foregoing one, it would be simple to experiment until the right conditions were determined.

THE chief benefit of atmospheric control in the press room is to prevent "scaling" or drying of the surface of the dough. Bakers have solved the corresponding problem in their fermentation room. Maybe the macaroni manufacturers could learn from the bakers (see "Temperature and Humidity Control at Three Levels Needed Here," June, FOOD INDUSTRIES, p. 305).

3. Drying rooms should be airtight and completely and effectively insulated against temperature differences from outside. Since drying rooms are usually built inside of larger working rooms, the latter should be air conditioned so that they are maintained at uniform but comfortable working conditions. A 10-deg. depression of the wet bulb thermometer is suggested for the workroom, but it might be even better to operate at a constant 20-deg. wet bulb depression.

The reason for this recommendation for our ideal plant set-up is as follows: The drying rooms ought to be airtight—but they never are. They will always leak air. If it is possible to control the atmosphere in the workrooms around the drying rooms, and keep the air in always the same condition, it will then be possible to provide for a constant rate of infiltration, or leakage, of this conditioned air into the drying rooms. Then, by accomplishing this feature, the drying room job is already partially done. It will be possible, now, to cut down on the amount of equipment necessary to provide dry air to the drying room, for the nearly saturated air in the drying room must be replaced regularly by air which is capable of taking up more moisture, if the macaroni is to be dried.

Then, only two more things would be needed for the drying room. Each one should be equipped with a small unit humidifier and heater, so constructed and equipped with automatic control instruments that the temperature can be regulated to 1 deg. and the humidity within 1 per cent, and kept there! And each room needs a set of variable speed fans to produce the right amount of air motion.

ALL of the previous description of an ideal set-up for a macaroni plant may sound like the Rolls Royce of atmospheric control. But there are a great many drying rooms now being operated where more luck than science controls the drying. If it were not for the fact that, during the start of the drying period, the fresh goods give up enough moisture to dampen the air and thus prevent too rapid drying, they would give a lot of trouble. In such a case, it is easy to see what would happen if the room were only half-filled when drying begins. Of course, after long experience, a smart superintendent or foreman who has "drying sense" can learn how to get along somehow. If he can't, the company may go broke. It is not really control. But after true atmospheric control is operated under proper conditions, it would be recognized for what it is—sheer luck.

Editor's Note: Detailed discussions of macaroni drying were published in FOOD INDUSTRIES *for December, 1930, and January, 1932.*

Air-Conditioned Smoke Room Gives Close Control

Regulates temperature, humidity, air motion, smoke density. Seven important advantages are realized

By WALTER JONES
Carrier Engineering Corp., Newark, N. J.

SMOKE-CURING, though an ancient art, involves many factors of treatment other than smoking alone. And the smokehouse of the farm and fishery has been improved in industrial use until today it comes well within the category of a fully-controlled atmosphere.

In setting up specifications for the ideal smokehouse, the progressive packer undoubtedly would include the following items:

1. Provide means for producing and maintaining under uniform and accurate control—temperature, humidity, rate of air motion over product and smoke density.
2. The smoke and air admitted to the smokehouse must be pure—free from objectionable dust, soot and ash.
3. Temperature and humidity must be automatically controlled, and it is desirable that a chart record of temperatures and humidities be provided so operations can be checked and duplicated by reference to master charts.
4. The smokehouse must be insulated to conserve heat. The insulation must be of a type that has low heat capacity so that the atmosphere in the house can be quickly raised or lowered in temperature. The apparatus must be so arranged that the smokehouse can be used for surface drying only, drying and smoking, and quick cooling after smoking.

The accompanying diagrammatic sketch shows an air-conditioned smokehouse designed to meet these exacting specifications. The room is insulated with sheet cork with cement finish, or other insulating material of light weight. A system of ducts is provided for uniform distribution of air and smoke over the product. The principal elements of the equipment consist of a fan which discharges air through heater coils and a duct which leads into the duct-distribution system in the smoke room. A return duct from the smoke room is connected to the fan-inlet so that recirculation of the air and smoke is effected.

Smoke is produced in the familiar way by burning sawdust. In this case, the sawdust is burned in a brick-lined chamber of fireproof construction. The smoke from this chamber is fed into the recirculating system by means of a duct connection to the fan suction. A hand-operated damper in this duct controls the amount of smoke admitted and regulates its density in the product space. Specially constructed filters, which are easily removed for cleaning, are located in this duct to filter out the ash and any large particles of carbon.

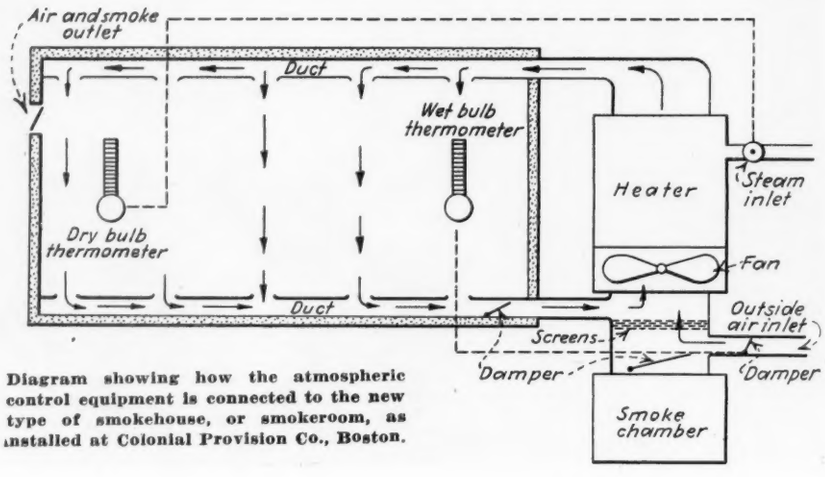


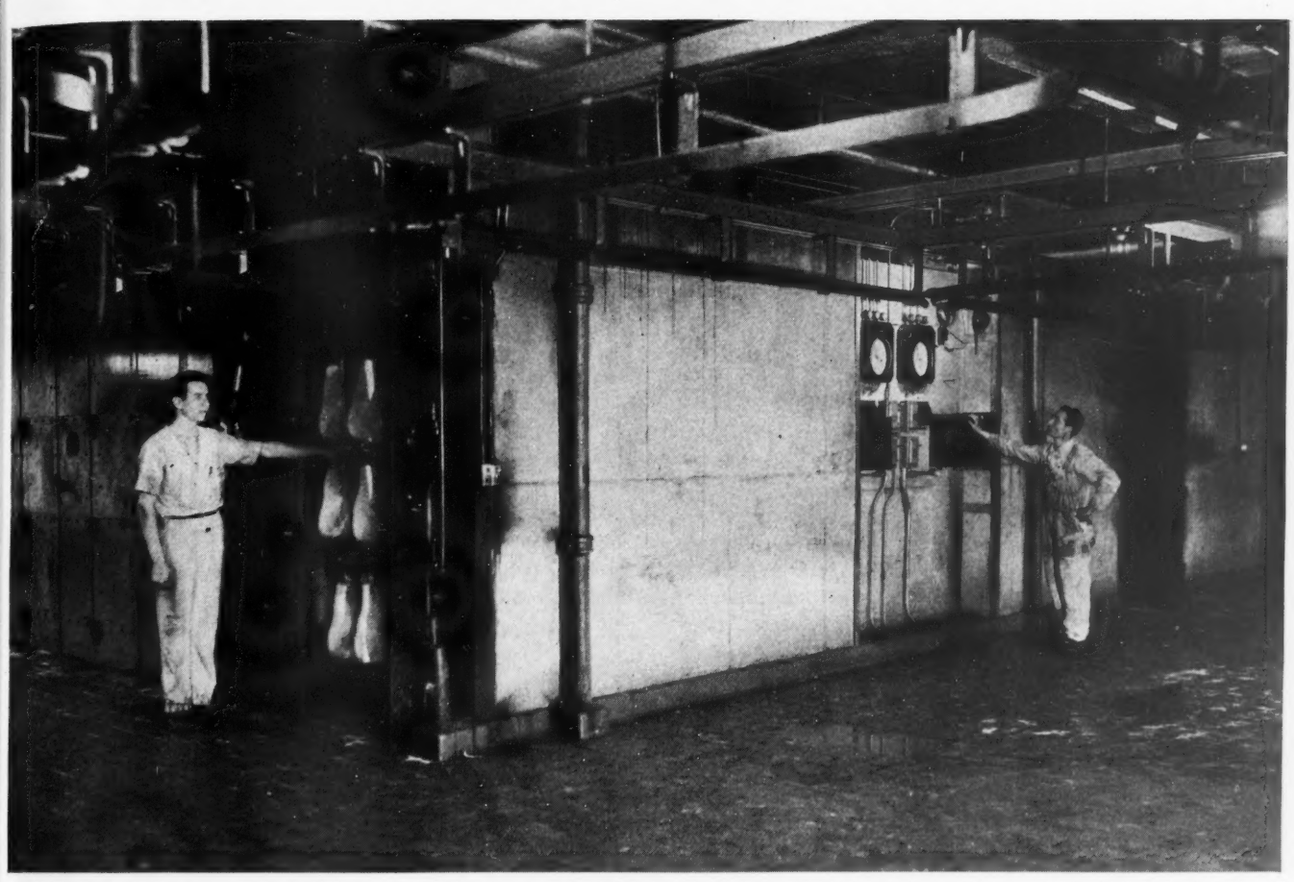
Diagram showing how the atmospheric control equipment is connected to the new type of smokehouse, or smokeroom, as installed at Colonial Provision Co., Boston.

SINCE drying, or shrinkage, of the product is an essential part of the smoke-curing operation, means must be provided for dehumidification of the recirculated air and smoke mixture. To provide for this, an outside airduct connection is made to the fan inlet, which is also provided with a damper. As the air in the chamber takes up the moisture from the product, a controlled amount of outside air is admitted and a corresponding amount released from the room. Because of its comparatively low temperature, the outside air admitted has a low moisture content, and this air, when expelled from the room, has taken moisture from the product because its rise in temperature has increased its capacity to absorb moisture. Humidity control is provided by means of a wet-bulb thermostat located in the room, which actuates the outside-air damper and controls the quantity of outside air admitted. A filter is provided in the outside-air intake duct to insure only clean air being admitted to the room. The excess air and smoke brought into the room is expelled to the outside through check dampers located in a wall or ceiling of the room.

A thermostat, located in the room, controls the flow of steam to the heater coils and thus provides for temperature control. Both the temperature and humidity controls are of the recording, as well as indicating type, so that a record can be provided for all smoking operations. The recording feature permits the development of standard, or master, charts which can be followed by the operator.

The equipment is selected and arranged to provide the maximum flexibility of control and to permit variation in operating methods to suit various types of products. Tempera-

Controlled



Outside view of the new air-conditioned smokehouse at Colonial Provision Co., Boston. Automatic control instruments assure uniform and quality performance.

tures can be closely controlled at any point up to 180 deg. F. The low-heat capacity of the room insulation permits rapid change in temperature for light products when this is desirable. In addition to performing its chief function of smoke-curing and drying, the equipment is arranged for rapid surface drying of the wet product without smoke. At the end of the smoking operation, the outside-air damper may be opened wide and, with the heat shut off, the product may be quickly cooled. Adequate cooling of the product is desirable if it is to be immediately placed in a cool hanging room.

To meet the requirements of small plants, the equipment is arranged for smoking small products during the day and heavy products during the night shift.

THIS positive control, combined with greater freedom for space selection by isolating the heating and smoke-producing means from the space itself, results in important advantages, some of which follow:

1. Improvement in product both as to quality and appearance. The product comes out of the smokehouse with exceptionally bright and clean surfaces. The shrinkage is uniform and at a minimum. The color is either light or dark, as desired, and is consistent with the smoke density maintained during smoking.

2. Decrease in time required for smoking operations. This gain can be obtained because of more uniform temperature, higher rate of air motion over the product, and close control of humidity, all of which affect the drying rate. Experience shows that for local markets, where only a light shrink is required, smoking of heavy products can be done in eight hours or less.

3. Reduction and close control of shrinkage. Because of uniformity of conditions maintained in this smoke room, uniformity of shrink, close to the minimum, is assured in all of the product.

4. Decrease in operating labor. All of the smoking operations are carried out on one floor; with smokehouses several floors high, an operator is required on each floor. After the room is loaded and controls are adjusted, there is no need to enter the room and re-arrange the product.

5. Decrease in space requirements. This advantage is again due largely to the location of the smoking rooms on one floor. Decrease in smoking time, as indicated in No. 2, is also a factor in space reduction. This is particularly true of a light product, which can be handled rapidly through this room.

6. Decrease in fire hazard. Since all of the carbon particles are filtered out, there is a minimum of loading of the smoke room or duct surfaces with combustible material. Moreover, the smoke is produced in a closed burner of fireproof construction. Closer control of temperature insures almost complete elimination of grease on the floor and fixtures. In one installation, the insurance premium is 25 per cent less than the premium which would be charged for the conventionaly type of smokehouse.

7. Reduction in sawdust burned. Since the mixture of smoke and air is recirculated, the required smoke density can be maintained with a relatively smaller amount of total smoke admitted to the room, and consequently, with less sawdust burned. Reduction in smoking time is also a factor conserving sawdust.

Air-conditioned smokehouses can be secured with comparatively simple and standardized equipment and controls, which are reliable in operation. Practical plant operation of the equipment has proven that it produces results and functions in a completely satisfactory manner. It cannot be too strongly emphasized, however, that these applications must be engineered by someone well-informed as to the problems involved.

▶***Controlled-atmosphere smoking is applicable to:***

Meat and meat products
Smoked fish
Smoked yeast
Smoked salt

Even though appearances are deceiving these photos are of the same plant. They were taken while alterations were in progress and after they were complete.

Makes a New Plant From an Old One

Baking company takes over closed bakeshop and converts it into a fully modern plant

By EARLE F. WEISBROD
President, Scotland Bakeries, Inc.
Orange, N. J.

"HOW did you get hold of such a place as this?" is the question we have been asked repeatedly since the recent opening of our Plainfield, N. J., plant.

The answer is, "We didn't. We made it this way."

When the Scotland Bakeries, Inc., took over the O Boy Bread plant we merely acquired a very desirable site and the opportunity to convert an old and abandoned peel-oven bake-shop into a fully up-to-date plant which we feel is essential to the successful production of our type of bakery products.

By "our type of bakery products" we mean products which, for best merchandising results, must be made under plant conditions as identical with home kitchen conditions as is humanly possible to attain. Consequently, we did not waste any time or effort in trying to give the plant a superficial cleaning up preliminary to beginning plant operations.

WE STARTED at once to make the plant as it now is. From the "during"-and-"after" alteration photos shown on this page there is ample evidence of what has been accomplished on the outside of the plant. Equally striking changes were made on the inside.

All old equipment was either junked or traded for credit on a complete line of new equipment. All walls and ceilings were thoroughly washed down with a hypochlorite solution to destroy the bacteria, wild yeasts and molds and to clear up the musty and other objectionable odors.

When we took over the plant it had a barnlike interior with beams, rafters and joists exposed. All operations had been carried out on the first floor with the mixers, fermentation troughs, ovens, packing tables and other equipment in one open room with no provision for humidity, temperature or odor control. The second floor was used for bulk storage only and was connected with the first floor by chute and a manually operated hoist.

We have made the plant a two-floor affair with the actual bakeshop operations on the first floor. The second floor has been connected with the first by front and back stairways, by a centrally located 2-ton automatic service elevator for general use, by a ½-ton manually-operated dummy elevator to transport cake and cooky batters, pie fillings and icings to the first floor make-up department, and by a metal chute for dropping bread and roll doughs to the divider below. In addition the second floor has been divided into definite areas. In one-half of the front area have been estab-

lished the general offices and the salesroom. These rooms are cut off from each other and from the other areas by painted wall board partitions of ceiling height.

The other half of the front area consists of an enclosed 20x24-ft. fermentation room equipped with the Tenny Manufacturing Co. new type automatic temperature and humidity control unit. This room is connected with the bread and roll mixing department by a self-closing door.

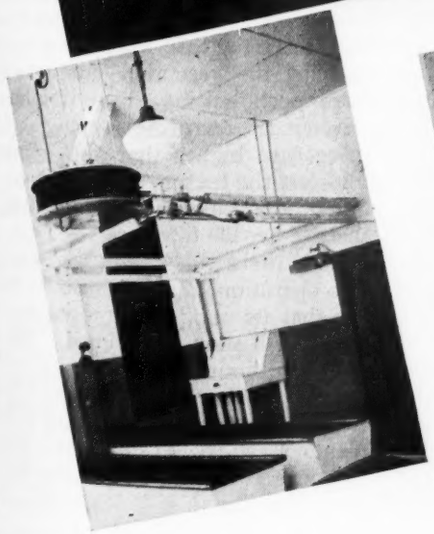
IN THE side center of the floor and opposite the general service elevator we have installed an enclosed ingredient room for the storage of small quantity ingredients and for the batch-weighing of all ingredients other than flour and water. Between this ingredient room and the fermentation room is the mixing equipment. It consists of a Century three-way flour sifter and blender and a 650-lb. capacity stainless steel mixer. The mixer is fitted with an overhead weigher, a circulating ice water jacket, a Gottfried automatic temperature and water-flow control unit, and an automatic mixing timer.

Directly across the room and adjoining the plant manager's office is the mixing department for cakes, cookies, pie fillings and icings. The mixing equipment for this department consists of two Century Giant and one Read vertical mixers commonly used for cake and cooky work. Boiled pie fillings are prepared on a gas open-fire cooker over which is a hood to direct the steam and odors to a duct vented above the roof of the building.

Between these mixing areas and adjoining the sales and fermentation rooms are the dummy elevator to the first floor and the small utensil washing department. A metal rack attached to the walls over the sink and drain boards serve as a drying and storage place for these utensils.

Adjacent to the cake mixing department and near the general service elevator we have built a 5-ton refrigerator which is automatically held at 38 deg. F. by fin-type cooling coils suspended from the ceiling and connected with Frick compressor unit on the first floor. Another such refrigerator has also been built in the cake make-up department on the first floor for the storage of fresh fruits and berries used for pies and cake toppings as well as for 93-score butter and other perishables used in pies and cakes.

Except for the area over the boiler room the rest of the second floor is used for bulk storage of flour and



Left: Wherever possible all equipment is mounted on casters to facilitate moving of goods in process from one production area to another and to make thorough cleaning of the floors easier.

Below, left: New type of temperature and humidity control unit keeps conditions in bread-and-roll-dough fermentation room under automatic control. Desk in corner of room is for the convenience of the foreman in keeping a record of his doughs.

Below: Would you think that this area was formerly one corner in a second-floor bulk-storage room? Note its well-lighted condition, its painted walls, the hard maple floor, the hinged doors for the dummy elevator, and the means for removal of fumes and odors from the open-fire cooker. End of storage rack for small utensils is in upper right hand corner.

sugar in bags on lift-truck skids and for salt, milk and shortening in barrels and steel drums. The area over the boiler room we have made into shower, dressing and comfort rooms for the employees. Since we are sold on the advisability of having women bakers and packers for our cakes, cookies and pies we have to have these employee rooms in duplicate. No such facilities existed when we took over the plant.

Comparable changes have been made on the first floor, which we have devoted entirely to bakeshop and packing operations.

One whole side of the bakeshop has been given over to the production of bread and rolls. As the bread doughs drop through the chute from the fermentation room they fall into a Century two-pocket divider which has a synchronized close-connected automatic hookup with a rounder, overhead proofer and molder. After molding, the loaves are panned, racked and wheeled into a three-compartment nine-rack steam proofer.

Roll doughs are dropped through another leg of the chute onto a hand bench adjacent to the bread makeup units. Here they, as well as pie doughs, are shaped up and made ready for further handling and baking.

FOR bread and roll baking we did try to salvage one of the old-time brick peel ovens. Already we see that we shall have to replace it with a new, probably another traveling tray oven such as we put in for our pies, cakes and cookies. Fumes and odors from both ovens are vented through ducts to the chimneys of the oven furnaces. Additional ventilation for the bakeshop is obtained by two large fans discharging through windows at the rear of the ovens.

It is in the other half of the bakeshop and in the adjoining packing room that we employ our women bakers. Except for the heavier work, particularly the bench work on pie doughs and the loading and unloading of the oven they do the make-up work for pies, cakes and cookies. These goods comprise about 40 per cent of our output, and offer us the opportunity to prove that by selection of the proper factory facilities and personnel we can produce goods comparable, if not superior, in quality to those made by the most discriminating housewife in her own kitchen.

Our packing and shipping room is completely cut off from the bakeshop except for a sliding door passageway. Skylight as well as wall windows assure plenty of natural lighting and ventilation. Even a bridge-like woven-wire mezzanine compartment has been built across the middle of this room to assure ample cross-ventilation for the storage of our boxes and wrapping materials. Further protection for our products is provided through the use of easily-cleaned solid fiber hampers in our ½-ton delivery trucks.

Across the far end of the packing room we have installed a separate department for open-fire cooking of boiled icings and for deep-fat cooking of doughs and crullers. Fumes and odors from this department are vented into the boiler smoke stack through a duct from the hood over the cookers.

IN THEIR present state all walls and ceilings throughout the plant are of heavy wall board and are covered with three coats of white daylight paint trimmed with a blue grey dadoo extending up about 4 ft. from the floor. This paint job is the same as found in other well-known food manufacturing plants of strictly modern construction. The paints used give a smooth finish to which dust does not easily cling and which is resistant to the action of temperature, light and vapors. They are good for two or three washings each year and do not have to be replaced oftener than every four years.

Formerly the floors throughout the plant were of pine with plenty of open joints. Now they are of hard maple with close-fitting joints and a wear-resisting, easy-cleaning, oil-treated surface.

Early in our overhauling of this plant we discovered that we faced a complete replacement of the boiler and plumbing facilities. The boiler was a wreck. To assure ourselves of plenty of hot water and steam a new 50-hp., horizontal, coal-fired Fitzgibbon boiler was installed and the ½-in. water lines into the plant were replaced with 2-in. lines. Since the boiler room is cut off from the bakeshop proper there is no possibility of ash dust getting to the make-up or packing departments.

To complete our revamping job a concrete floor was put in the enclosed truck loading and overnight storage garage alongside the packing and shipping room. Previously this garage had a dirt and cinder floor from which a small cloud of dust arose each time a truck entered or left the garage. Now we can maintain a clean white interior of the garage by periodic painting and feel assured that there is little likelihood of street dust and dirt getting into our packing department.

A full-plant fumigation with a formaldehyde preparation added the finishing touches on our putting this plant into the condition we think advisable for the production of the rich-formula products we have been putting on the market since we opened our first plant in Orange, N. J., about a year and a half ago.

THIS procedure of rehabilitating an old plant may appear a bit extreme and expensive yet we have not found such to be the case when we take into account the reception our products have been getting from the housewives in the territories we cover. Our prices are higher than our competitors, yet the texture and the flavor of our products are sufficiently better, so that we get the business.

This is the third plant we have put into operation, and present indications are that its maximum production capacity will soon be reached. We set a definite limit on the territory served by each plant and the number of ½-ton trucks we will operate from each plant. Each truck represents a house-to-house route of not greater length than 15 miles.

Traveling tray oven for cakes, pies and cookies operates under variable speed control and is equipped with temperature recording instruments to assure controlled baking conditions. Upon removal from oven the goods are wheeled into an adjoining room for cooling and packing.

How Production and Availability Of Raw Materials Affects Quality

By M. E. Parker*
Manager of Production
Beatrice Creamery Co., Chicago, Ill.

ONE of the important things that affects the quality of butter is the distance of the source of the raw material, cream, from the market. Usually, the shorter the distance, the better the quality. This reference to "distance from the market" involves more than the mere actual distance measured in miles. It refers also to time, for age is a vital factor in producing quality raw materials.

Volume of production, and the availability of cream supplies have an important bearing on the ability of the butter industry to make a high quality product and incidentally to make a little money.

The finer grades of butter come from those states where the most butter is made. In the table is shown the figures which give production by state, average production per acre, and the total land area in each state. A study of that table reveals many interesting facts. In Minnesota, for example, approximately 5.8 lb. of butter are produced per acre while, in Tennessee, only 0.65 lb. are made. In Wisconsin they churn about 4.4 lb. of butter per acre, but in Mississippi they make ¼ of a lb. per acre. In Iowa they have the best record of all—nearly 6¾ lb. of butter per acre. In the Middle West, Kansas produces a little better than 1½ lb. per acre, while Illinois, Missouri and Nebraska make close to 2 lb. per acre. With the exception of Illinois, with its big industrial areas, it is noticeable that as one proceeds north into the more populous agricultural states, the production of butter per acre increases. For example, Indiana produces 3⅓ lb. of butter per acre and Ohio produces nearly 3¼ lb.

ONE important fact, that is often overlooked, is that the bulk of the creamery butter produced in the United States is made in the Middle West agricultural section where dairying is oftentimes a chore and not the primary function of the farm. Most of the butter comes from regions which are not commonly regarded as dairy regions. Although Minnesota, Wisconsin and northern Iowa produce about one-third of the butter made in the United States, and not all of that is sweet cream butter either, the greater bulk of the butter produced in the United States comes from the other central states, such as southern Iowa, Illinois, Indiana, Ohio, Nebraska, Missouri, Kansas, Oklahoma, Mississippi, Tennessee, Kentucky, and possibly others. Collectively, these agricultural states, excluding Minnesota, Wisconsin and Iowa produce approximately 50 per cent of the total production of butter in the United States.

There are nearly 5,000,000 farms in the United States and it is a fair assumption that, at least 2,000,000 of them are engaged in the production of cream for butter manufacture. There are approximately 4,500 creameries which means that each creamery draws its raw supply from an average of about 450 farms. It is recognized that some creameries draw only from a few farms, while others draw from thousands.

Another important fact to recognize is that the creamery has no direct means of controlling the quality of the cream supplied by these farms, except by appealing to the producer's pocketbook. Unquestionably, the one factor which has been of the greatest influence for improving cream quality is the differential in price paid for good cream, over the price paid for cream of only fair quality. Vital as this factor is to the quality of creamery butter, few people realize that cream buying is not a local function.

The milk dealer has his regular patrons, i.e., farmers who produce milk for him regularly. Their milk is produced under sanitary conditions which are supervised either by a local or State Department of Health, or both. In other words, the quality problem of raw milk supplies has been solved for the market milk industry largely through the cooperative efforts of official health departments. All of which is possible because the milk supply in a given market is produced in a localized area where supervision is relatively simple.

WE cannot ignore the important fact that a major portion of the cost burden for such improvement has not been borne by the market milk industry itself. On the other hand, the creamery butter industry does not enjoy such an inexpensive means of

Butter makers and canners have a similar problem in assembling their raw materials.

Long ago the canners found out that bigger yields per acre came from the biggest plantings. And usually the best quality came from the biggest yields per acre. The butter makers have exactly the same sort of an experience. The only significant difference is that butter-making is a year-round job.

On the other hand, the milk dealer has it pretty soft when it comes to control of raw material quality. The health departments of some cities or states usually put the fear of God into the farmer; but the butter-maker has to fight his own battles, and pay practically the entire cost of quality control of raw material.

Those concerned with management and quality control of raw materials in the following lines will see some of their own troubles reflected here.

Butter-making
Ice cream manufacture
Canning
Cheese making
Dairying
Tomato Products Manufacture

*Chairman, Research Committee, American Association of Creamery Butter Manufacturers.

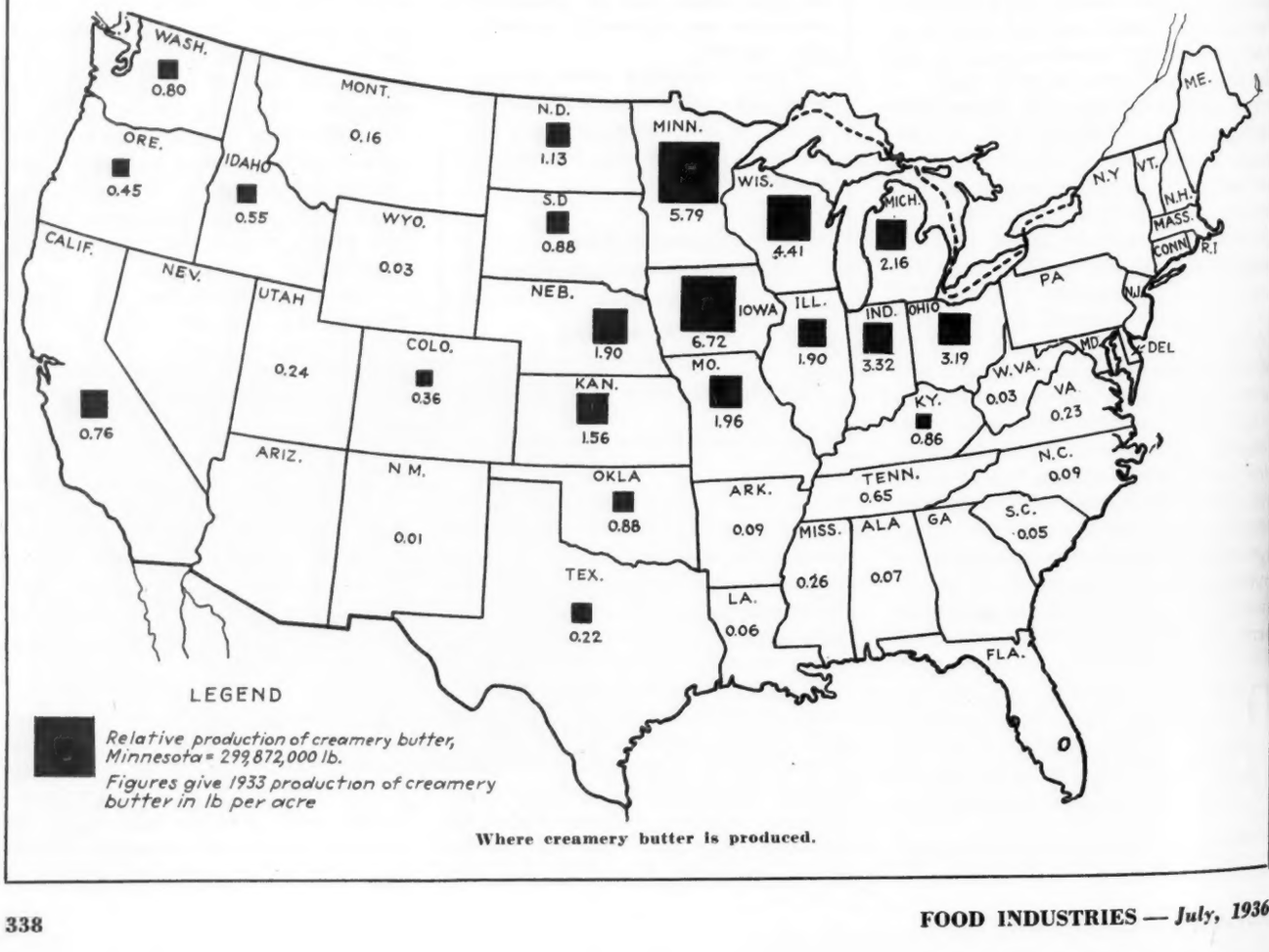
quality improvement or quality control. There are no municipal or state health departments with funds to pay the cost of this function for the butter industry. The expense for any such improvement must, in a large measure, be borne directly by the industry itself.

And here is where the factor of distance from the market is very important. The raw material is produced in the less populous areas of the country where the distance of the producing farmer from his market varies from a few to a great many miles. In Minnesota it averages about 4 miles, while in Texas and Montana it averages between 40 and 50 miles. It is because of these widespread operations and lack of more intimate contact that the creamery butter industry has a greater turnover of producing patrons. Thus the creamery butter industry has problems with which the market milk industry has never had to cope. It is the contrast between the substantially national enterprise and one which is a practically local business.

Relation of Butter Production to Acreage by States

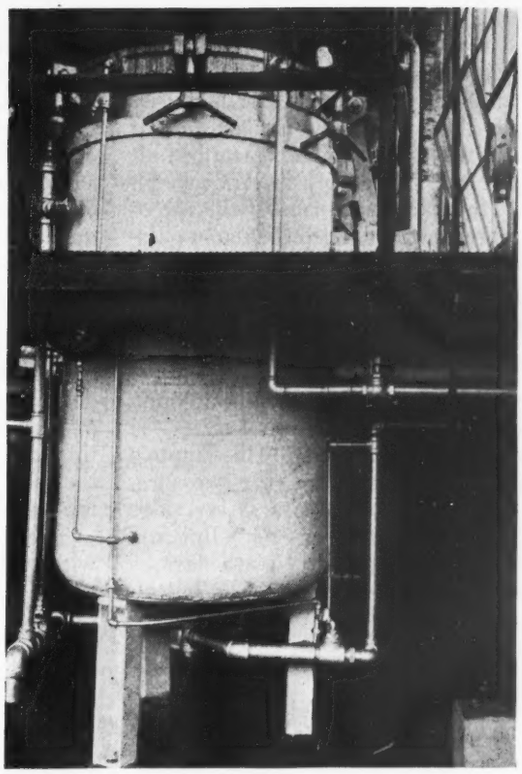
Authority: W. F. Jensen, Statements before Committees on Agriculture, U. S. Senate and House of Representatives, March, 1935

State	Total Land Area Acres	Creamery Butter Lb. Total	Production 1933 Lb. Per Acre
Minnesota	51,749,120	299,872,000	5.79
Iowa	35,575,040	239,125,000	6.72
Wisconsin	35,363,840	157,933,000	4.41
Nebraska	49,157,120	93,361,000	1.90
Missouri	43,985,280	86,138,000	1.96
Ohio	26,073,600	83,076,000	3.19
Kansas	52,335,360	81,969,000	1.56
Michigan	36,787,200	79,637,000	2.16
Indiana	23,068,800	76,508,000	3.32
California	99,617,280	76,194,000	.76
Illinois	35,867,520	68,106,000	1.90
North Dakota	44,917,120	50,799,000	1.13
South Dakota	49,195,520	43,393,000	.88
Oklahoma	44,424,960	39,280,000	.88
Texas	167,934,720	36,543,000	.22
Washington	42,775,040	34,146,000	.80
Idaho	53,346,560	29,420,000	.55
Oregon	61,188,480	27,308,000	.45
Colorado	66,341,120	23,909,000	.36
Kentucky	25,715,840	22,029,000	.86
Tennessee	26,679,680	17,433,000	.65
Montana	93,523,840	14,795,000	.16
Utah	52,597,760	12,754,000	.24
Mississippi	29,671,680	7,855,000	.26
Virginia	25,767,680	5,910,000	.23
Arkansas	37,584,000	3,247,000	.09
North Carolina	31,193,600	2,878,000	.09
Wyoming	62,430,720	2,464,000	.03
Alabama	32,818,560	2,404,000	.07
Louisiana	29,061,760	1,879,000	.06
New Mexico	78,401,920	952,000	.01
South Carolina	19,516,800	948,000	.05
West Virginia	15,374,080	454,000	.03



Where creamery butter is produced.

How Underwood Avoids Clogged Controls

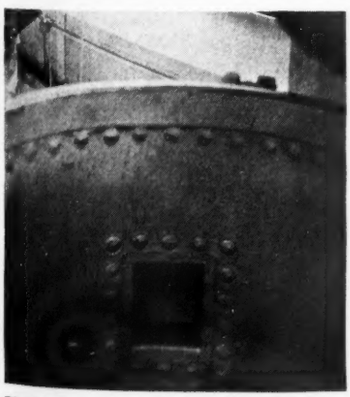


Showing how Underwood Company hooks on the recording pressure gage to report any accidental pressure variations.

▶ *How this company keeps its automatic control instruments and valves from plugging up will be helpful to all plants where temperature control is carried out by hot or cold liquids, including:*

Breweries
Canning Plants
Fruit Juice Bottlers
Milk Plants
Meat Packers
Preserving Plants

A GOOD improvement on automatic pressure and temperature control has been worked out at the plant of William Underwood Co., Watertown, Mass., the oldest canners in the United States. Their reasons for painting the inside of the equipment with aluminum paint, to be certain that the instruments will always work, is something that everybody ought to know. And so is their use of a recording pressure gage.



The insides are covered with aluminum paint to keep the rust and scale from forming. Canners will be especially interested in these extra large thermometer pockets, made especially to order. It is said that they allow better temperature control than small pockets.

Nowhere is automatic control of temperature and pressure more important than for sterilizing foods in glass containers, because any variations of pressure are likely to ruin the whole batch. Such a spoiled batch may set the company back anywhere from $50 to $300, depending mostly on how much money is tied up in the food inside the jars, and also on the size of the batch.

The system which Underwood uses for sterilizing products in glass containers by means of heat is the well-known system of "water cook" developed in the research laboratories of Anchor Cap & Closure Corp. Most kinds of caps for glass containers are made in such a way that the greater the pressure outside the jar, the more firmly are they held in place. But if it ever happens that the pressure inside the jar becomes much greater than the pressure outside, some kind of caps may be forced off. Ordinarily, this condition could only occur during the time when the containers are in a retort being sterilized.

To avoid this, it is necessary to keep the pressure outside the jar somewhat higher than the pressure inside. Usually about 10 lb. per sq.in. is enough. This is done by either running a little compressed air into the retort in addition to the steam, or, as is more commonly done today, by trapping a rather large amount of air in the top of the retort when the lid is closed down tight.

WHEN sterilizing glass jars, the method is to nearly fill the unoccupied space in the retort with water. This water is then heated by live steam to whatever temperature is necessary, and the hot water heats the glass containers. The bulk of the air in the retort remains above the water where it cannot form any dead air pockets. This is important because, without the water, air pockets might form and prevent proper sterilization. Air has very low heat carrying capacity.

The water is heated by a steam injector located outside the retort. Next, this hot water must be circulated between the glass jars of the retort. The stream of hot water from the injector will take care of that if the piping is properly arranged, as shown in the accompanying drawing. It should be noted that one effect of the system is to draw air from the top of the retort and mix it with hot water then shoot it into the bottom. This has the effect of thoroughly mixing the incoming hot water with the water in the retort.

When the live steam in the injector

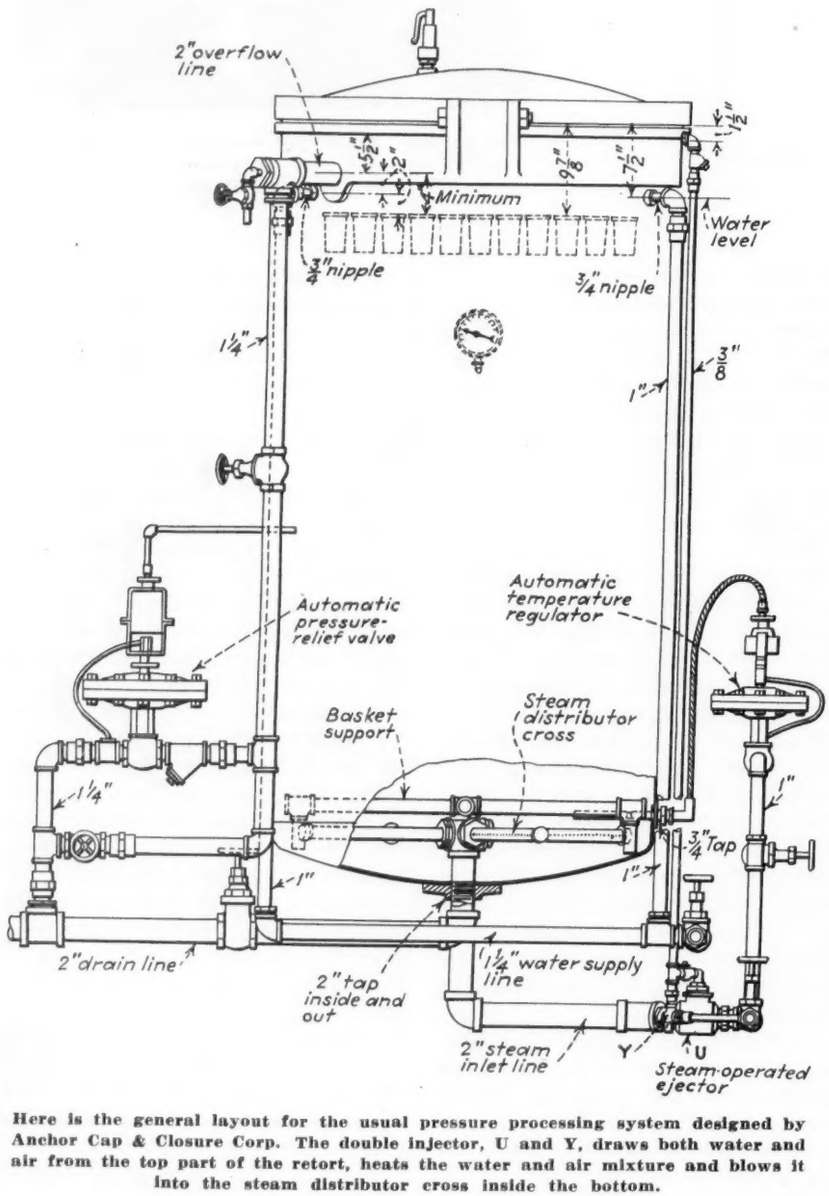
gives up its heat to the water, the steam is condensed and hence, more water accumulates in the retort. If the retort is absolutely tight, and the piping is tight, the increase in the amount of water will compress the entrapped air in the top. In the newest Anchor system, this takes the place of the use of compressed air to keep the retort pressure above what it would be if steam alone were used. However, to prevent any increases in pressure above what is desired, the system is equipped with a pressure-release valve. When the pressure goes above the right amount, the valve opens and lets out *water*. If the system were to operate like a retort for sterilizing tin cans, the pressure-release valve would be a safety valve at the top to let out *steam*. But in a sterilizing system for glass jars, a valve at the top would also let out *air* as well as steam, and the air must be kept back at all costs, or else a batch may be ruined.

It is absolutely essential that the entrapped air be kept in the retort all during the cook. The whole set-up of automatic valves and controls must operate so that pressure inside the retort will not drop, even though the pressure-release valve may be slightly open. If the pressure were to drop suddenly, and far enough, even for a few seconds while everything is above the boiling point of water, say at 230 deg. F., nearly every cap on every jar might be blown off. The reason why this could occur is that the water inside the jar, in the product itself, is above the boiling point.

The head space in the jar is filled with a mixture of a little heated air and steam (although there is not very much air if the product is filled properly), and unless the pressure around the jars in the retort is always great enough to more than balance the pressure inside the jars, the caps may be lifted off.

This lifting may be only momentary. It may barely open the jars. But when the retort pressure resumes the proper figure again, there is much likelihood of water getting into the product when the caps go back into place. The most dangerous situation arises when the cap is only strained so that the seal is weakened. It is dangerous because a weakened seal is not visible to the eye. In unusual cases the caps may be lifted so far that they never go properly back into place.

The foregoing is possible only with caps which are held in place by a pliable gasket supplemented by the vacuum inside the jar. In the case of other types of closures, they may be designed so that they are mechanically held in place. But, if the retort pressure should drop unexpectedly during the sterilizing operation, the bottles or jars might burst even though the caps were to stay in place.



Here is the general layout for the usual pressure processing system designed by Anchor Cap & Closure Corp. The double injector, U and Y, draws both water and air from the top part of the retort, heats the water and air mixture and blows it into the steam distributor cross inside the bottom.

THE problem resolves down to having an adequate and accurate system of pressure-temperature control that operates all the time. However, *if* the pressure of the steam supply should fluctuate violently or drop too low, or *if* someone should make a mistake and turn the wrong valve, or *if* other unexpected things should happen, a disastrous drop in the pressure inside the retort might be caused to occur.

When Underwood packs in glass, they use a red opaque glass container. It is purposely made so that one cannot see through it, for merchandising reasons. If a mishap, such as the foregoing pressure-drop, should occur the company would have to face the problem of inspecting every single jar for potential spoilage water. And where the containers are not transparent that would be quite a job. Also, there is no chance for the labeling crew to spot the occasional jar that might have water inside. If there should arise the slightest need for inspection after sterilizing, it would have to be done by a special crew.

To decide when such inspection might be needed, the company has put a recording-pressure gage on each retort and whenever the record indicates fluctuations it means that a rigid inspection of every jar in that particular batch is needed. This tell-tale pres-

(Turn to page 378)

Tests of Fifteen Types of Packages Show Importance of

Vacuum Containers

What is the best type of package for a food product? Every available type is useful for certain products, but tests show the vacuum can is best for fat-containing dry foods.

By P. W. PUNNETT and W. H. EDDY

Teachers College, Columbia University, New York, N. Y.

FOR each individual product there is generally one particular type of container which is best for that product.

"Superiority" in a container depends on many factors and their reaction upon the consumer. Artistic design, convenience, low cost—all are important in promoting the sale of the product. The most important factor in many cases, however, is that of the relation of the package to the quality of its contents. It must afford protection to the product and get it to the consumer in the best of condition. If there is any tendency for the product to lose its high quality during the time of warehousing, shipment and handling in the retail store, then such protection as many be obtained by the proper choice of the container is the first and most important thing to consider. If the product reaches the consumer's table in a poor form so that he is dissatisfied with its flavor, consistency, or cleanliness, then no efforts put in on the design of the package for appearance or convenience are going to keep on selling the product. The artistic appearance of the package matters little if the product is unpalatable.

▶ ***Foods containing fats or oils may lose their fresh flavor by oxidation or the development of rancidity. Vacuum packing in a sealed container is a solution of this problem that may be used by packers of such foods as:***

Bacon
Coffee
Nuts
Peanut Butter
Shredded Coconut

The packaging of coffee is an example of the importance of the protection of the product while it is making the trip from the factory to the table. In an article[1] previously published in FOOD INDUSTRIES, it was pointed out that the coffee roaster is selling flavor, and only flavor, to his customers. It is not the dark-brown material we know as coffee, nor a gayly decorated container which may have re-use value, that he sells. It was also pointed out that everything the coffee roaster can do to get that flavor to the consumer's table in a form that is pleasing and economical, is going to promote the sale of his product. While that article was chiefly a discussion of the value of proper grinding, the importance of getting the coffee to the consumer in a fresh condition was mentioned. "Freshness," of course, refers to the quality of the flavor present in the product, and flavor is at its peak immediately after roasting and grinding.

In an earlier article[2] in FOOD INDUSTRIES, the authors have described a test, which they have called "The Standard Cup Method." By this test, it is possible to measure the quantity of flavor present in a sample of cof-

Table I: Relation of Type of Coffee Package to Flavor Quality in Per Cents

Pkg. No.	Days After Roasting: 2	3	4	5	6	7	8	11	13	14	17	18	21	22	27
1	90F	70F	...	45F	...	45F	42F	35F+30S	35F+40S	.....	35F+60S	.....	...	35F+70S	35F+65S
2	95F	75F	...	60F	...	55F	50F	45F+30S	40F+50S	.....	35F+70S	.....	...	35F+45S	35F+50S
3	95F	75F	...	55F	...	50F	40F	40F+30S	35F+50S	.....	35F+65S	.....	...	35F+75S	35F+65S
4	92F	...	65F	...	65F	...	50F	40F+25S	.....	35F+55S	.....	35F+75S	...	35F+75S	35F+55S
5	92F	...	60F	...	60F	...	55F	38F+25S	.....	35F+40S	.....	35F+65S	...	35F+80S	35F+60S
6	95F	...	75F	...	62F	...	60F	40F+30S	.....	35F+45S	.....	35F+60S	...	35F+70S	35F+75S
7	92F	...	70F	...	58F	...	55F	35F+25S	.....	35F+40S	.....	35F+65S	...	35F+75S	35F+65S
8	95F	75F	...	60F	...	55F	48F	40F+25S	35F+45S	.....	35F+60S	.....	...	35F+55S	35F+60S
9	95F	...	72F	...	58F	...	55F	35F+30S	.....	35F+40S	.....	35F+65S	...	35F+70S	35F+70S
10	95F	...	65F	...	50F	...	52F	40F+30S	.....	35F+40S	.....	35F+45S	...	35F+70S	35F+75S
11	92F	...	72F	...	50F	...	45F	40F+20S	.....	35F+35S	.....	35F+40S	...	35F+75S	35F+75S
12	...	85F	...	65F	...	60F	55F	45F+25S	40F+30S	.....	35F+75S	.....	...	35F+60S	35F+60S
13	95F	80F	...	60F	...	60F	52F	45F+20S	40F+45S	.....	35F+75S	.....	...	35F+40S	35F+45S
14	100F	80F	...	65F	...	65F	50F	40F+20S	35F+30S	.....	35F+25S	.....	...	35F+40S	35F+55S
15	...	...	...	...	...	...	87F	.....	.....	.....	.....	.....	80F	.....	.....

"F" refers to the true coffee flavor—freshness.
"S" refers to the flavor produced in coffee by oxidation—staleness.

fee. Using this method, they gave the results of flavor measurement on several samples of coffee exposed in open pans and packed in slip-covered cans. These tests showed that loss of flavor occurs quite rapidly in roasted coffees. A ground coffee loses about 50 per cent of its flavor in the first ten days after roasting and grinding; that on or about the tenth day a different flavor appears, which is called "staleness," and thereafter increases rapidly; that the slip-covered can offered little, if any, protection to the coffee flavor. These conclusions have been proved since that time by a great many similar tests.

Here, then, we have a product which may lose quality very decidedly in a short time. Hence, any measures which can be taken to protect it and to prevent this loss of flavor, and especially to prevent the development of "staleness," are of utmost importance. There are many types of packages which have been, or may be, used for packing coffee, and a comparison for the purpose of determining their value in protecting the product is necessary in order to make a proper choice. The cost of the package is naturally of secondary importance, for the package which does not protect the coffee costs too much no matter how low the price. Following are the results of tests made upon fifteen different types of packages.

Following is a brief description of the packages used:

1. A Kraft paper bag.
2. A white paper bag lined with a glassine bag.
3. An ordinary coffee carton wrapped with parchment paper.
4. An ordinary coffee carton wrapped with waxed paper.
5. A coffee carton coated with metal foil.
6. An ordinary coffee carton lined with glassine paper and wrapped with Kraft paper.
7. An ordinary coffee carton lined with another carton.
8. A square fiber canister, metal top and bottom inner drum head and outer screw cap.
9. A square fiber canister as in No. 8, but lined also with a double paper and metal foil bag.
10. A round tin can with a slip-cover.
11. A round tin can with a friction top.
12. Round tin can with inner drum head and outer screw top cap.
13. A glass jar closed with a screw cap containing a waxed board liner.
14. A glass jar sealed with a metal cap—packed under vacuum.
15. The regulation coffee can for vacuum packing.

Packages Nos. 1-14 inclusive were filled with coffee immediately after roasting and grinding in a commercial plant. The vacuum used in No. 14 was unknown. Twelve samples of each type were put up and shipped to this laboratory along with 10 lb. of the roasted bean and 15 lb. of the original green blend. Twenty-four hours after roasting the bean coffee was ground and packed in No. 15 package under 25 in. of vacuum. This was 2-3 in. less than commercial practice at that time, but was the best that could be done in the laboratory.

These samples were tested for flavor strength at various intervals during about four weeks from the date of roasting. Each time a test was made a previously unopened package was used. The test method used was the Standard Cup Method already mentioned.[2] The results of the tests are shown in Table I.

EXAMINATION of the metal-cap-sealed glass jars, package No. 14, as they were opened showed failure of this type of container to protect the coffee flavor because particles of coffee had been blown under the sealing gasket at the time of vacuumizing. This naturally resulted in leaks and air entered the containers rapidly in the first few days. The lodgment of particles under the seal can be avoided as was pointed out in an article recently published in FOOD INDUSTRIES, "Vacuum Packing in Glass," by C. E. Kafka, Vol. 7, p. 448 (Sept. 1935).

The two vacuum cans which were opened at eight and 21 days, respectively, after roasting were cup tested at intervals with the results shown in Table II.

It will be observed that the rate of flavor loss after opening the cans in question is similar to that found in coffees not packed under vacuum. That is, the coffees lost flavor down to 45 per cent on the ninth day after opening, when staleness became apparent and increased rapidly from then on. Other examples of the rate of flavor loss will be given.

Table II: Rate of Deterioration after Opening Vacuum Packed Coffee in Per Cents

Can No.	0	3	5	7	9	12	13	27
1	87F	.....	55F	.....	45F+ 5S	.....	.....	35F+75S
2	80F	58F	55F	52F	45F+10S	35F+25S	35F+40S	.....

"F" refers to the true coffee flavor—freshness.
"S" refers to the flavor produced in coffee by oxidation—staleness.

Table III: Effect of Time on the Flavor of Coffee Sealed Under 25½ in. of Vacuum

Can No.	Time After Sealing	Flavor Strength (per cent)
1	2 days	97
2	2 weeks	83
3	1 month	75
4	1½ months	65
5	2 months	67
6	3 months	65
7	4 months	65
8	5 months	65
9	6½ months	70
10	7½ months	65
11	8½ months	65
12	9½ months	65
13	11 months	65
14	21½ months	70
15	5 years, 9½ months	65

Other tests on the vacuum can have shown that when the original vacuum is about 25 in., the flavor present will decrease slowly to about 70 per cent of its original value and remain constant at that figure during a period of years. Table III gives some results obtained in another set of experiments where a different blend of coffee was used (5 parts of Medellin Excelo + 3 parts of Natural Maracaibo + 10 parts of Bourbon Santos 4s). A number of cans were sealed under approximately 25½ in. of vacuum, opened at intervals and cup-tested against a fresh roast.

A number of the above samples were retested after opening at intervals of 1 to 3 days. In every case the coffee flavor decreased to a value of 40 to 45 per cent during a period of 9 to 10 days after opening. Likewise on the ninth or tenth day staleness became apparent and thereafter increased rapidly.

At the time (August, 1929) when the foregoing samples were packed, the vacuum commonly used in packing coffee was 27½ in. Since then, improvements in the machine, devised by Thomas M. Rector of General Foods Corporation, have made it practical to operate the vacuum chamber at a gage vacuum of 29½ in. In July, 1931, a number of tests were run on cans of "Maxwell House" coffee that had been packed for periods of 2 to 12 weeks. The results of these tests are given in Table IV.

In this table is a column headed "calculated original vacuum." The figures in this column are derived from determinations of the gas volume, pressure and composition made on each can by a method to be described in a future article. It is esti-

mated that these figures are accurate to ± 0.5 in.

It will be observed that the coffee samples ran uniformly 97.5 per cent in flavor strength. This amount is so nearly the same as that of freshly roasted coffee that only the most careful tasting by a person with considerable experience could detect the difference. And, of course, to the consumer this slight loss in flavor is entirely non-existent.

A number of the cans were tested at intervals to determine how fast flavor was lost after opening. The results are given in Table V.

IT WILL be observed that all of the samples showed rates of deterioration practically identical with that given in the article on flavor measurement.[2] Seven days after opening, the samples had lost 40-50 per cent of their flavor, and 9 to 10 days after opening the stale flavor became evident. We may conclude then that the use of a high vacuum, 28 to 29 in., in packing coffee will result in an inappreciable loss of flavor from the contents of the can and that such vacuum packed coffees behave *after opening* exactly like freshly roasted samples of coffee.

Through the courtesy of the Beechnut Company in furnishing samples of their vacuum-packed coffee of known ages, the results shown in Table VI were obtained.

The contents of the last can in the above table—No. 8—packed one month—were used as a standard for the cup tests on the others. It was arbitrarily taken as 100 per cent fresh, though the results given in Table IV indicate that probably it was not over 97.5 per cent in strength. Hence, the other results are all probably a little high due to this assumption. It cannot be claimed, likewise, that the flavor figures are extremely accurate since the samples probably varied slightly in the degree of roast and also due to the green coffees used. But since none of the green was available to make fresh roasts to match every sample, the use of the most recent sample as a standard was the best that could be done. For these reasons, samples Nos. 9, 21, 24 and 25 are probably rated 10 to 15 per cent too high, and samples Nos. 17, 13, 20, 23 and 24 are probably 5 to 10 per cent too high. These estimates are based on the figures in the column headed "Calculated Original Vacuum" and many other analyses.

We may summarize the problem and its solution as follows:

1. Coffee is a product the sale of which depends almost entirely on its flavor appeal to the consumer.

2. Unfortunately, however, coffee is one of those food products which undergo rapid flavor loss unless specially protected.

3. At the present time the only possible method of protecting the coffee flavor is through correct packaging.

4. Fifteen types of packages which have been—or might be—used for coffee have been compared for efficiency in preventing flavor loss. Fourteen of these (one only because of mechanical difficulties in sealing) were found to be of no practical value in this respect.

5. The only type of coffee package that affords any appreciable protection to the flavor is that which is heremetically sealed after the removal of practically all of the air in the container—notably the vacuum type container.

6. Whatever flavor deterioration there is in the vacuum packed coffee will depend upon the extent to which the air is removed from the container. For example, if 95 per cent or more of the air is removed, the flavor loss will be 5 per cent or less; if 90 per cent is removed, the loss will be about 10 per cent; if only 80 to 85 per cent is removed, the loss may be 25 to 35 per cent and so on.

7. Hence, the action of the air in the container upon the flavoring substances in the coffee is the cause of the loss of true coffee flavor and the development of "staleness."

8. Any such loss of flavor in vacuum packed coffee occurs in the first 4 to 6 weeks after packing. After that time the flavor remains constant as long as the can remains tightly sealed and no air enters. This is true for periods of many years.

9. Vacuum packed coffees do deteriorate after the can is opened—but no more rapidly than a freshly roasted coffee. For example, "staleness" cannot be detected until about 9 to 10 days after opening.

Table IV: Results of Tests made on "Maxwell House" Coffee Samples Packed Under High Vacuum

Can No.	Weeks Packed	Calculated Original Vacuum (inches)	Flavor Strength When Opened (per cent)
1	12	28.6	97.5
2	12	29.1	97.5
3	12	27.9	97.5
4	12½	29.2	97.5
5	12½	29.3	97.5
6	12½	27.3	97.5
7	6	27.9	97.5
8	6	27.8	97.5
9	6	27.7	97.5
10	6	27.5	97.5
11	6	28.1	97.5
12	6	28.1	97.5
13	2	28.2	97.5
14	2	28.6	97.5
15	2	28.7	97.5
16	2	28.2	97.5
17	2	28.3	97.5
18	2	28.5	97.5

Table V: Rate of Deterioration in Per Cents of Coffees Packed Under High Vacuum After Opening the Cans

Days After Opening	Can Number 1	3	6	8	10	12	14	16	18
0	97.5F	97.5F	97.5F	97.5F	97.5F	97.5F	97.5F	97.5F	97.5F
1	90F	90F	.....	.....	.....	.....	87.5	87.5	87.5
2	.....	.....	85F	80F	80F	80	Lost	.....	.....
3	80F	80F	.....	.....	....	.....	....	80	77.5
4	.....	.....	87F	67F	70	70	....	.....	.....
5	60F	60F	.....	.....	....	.....	....	.....	.....
6	.....	.....	55F	.....	.....	.....	....	65	65
7	50F	50F	.....	55F	55F	.....	....	.....	.....
8	.....	.....	.....	.....	Lost	.....	....	60	60
9	.....	.....	45F+20S	50F+15S	....	45F+15S	....	.....	.....
10	45F+30S	45F+30S	.....	.....	....	.....	....	45F+20S	45F+25S
11	.....	.....	45F+45S	40F+45S	....	40F+45S	....	.....	.....
12	40F+50S	40F+50S	.....	.....	....	.....	....	.....	.....
13	.....	.....	40F+65S	.....	....	.....	....	40F+65S	40F+65S
14	40F+70S	40F+75S	.....	40F+70S	....	40F+70S	....	.....	.....
15	.....	.....	.....	.....	....	.....	....	40F+80S	40F+75S
16	.....	.....	40F+75S	40F+75S	....	40F+75S	....	.....	.....
17	40F+75S	40F+80S	.....	.....	....	.....	....	.....	.....

"F" refers to the true coffee flavor—freshness.
"S" refers to the flavor produced in coffee by oxidation—staleness.

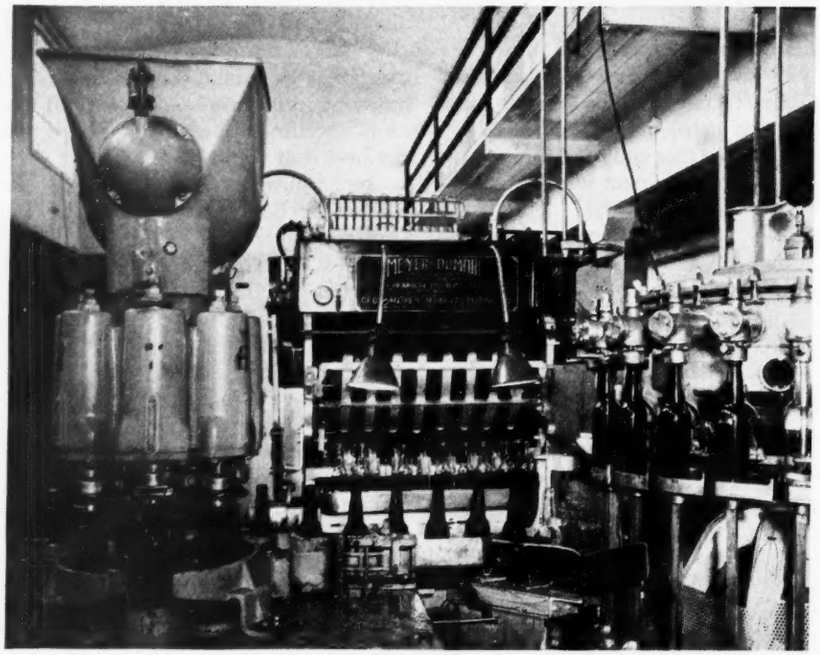
[1] "The Proof is in the Drinking," by P. W. Punnett, *Food Industries*, Vol. 5, p. 291 (Aug. 1933)

[2] "What Flavor Measurement Reveals About Keeping Coffee Fresh," by P. W. Punnett and W. H. Eddy, FOOD INDUSTRIES, (Sept. 1930)

Table VI: Tests Made on "Beechnut" Coffee Samples Packed for Various Times

Can No.	Date Packed	Age on Opening (yrs.—mos.)	Calculated Original Vacuum	Flavor Strength When Opened (per cent)
14	11-18-24	8— 7	20.0	40F+40S
9	3-16-26	7— 0	24.0	90F
10	7-21-27	5— 8	26.1	90F
11	11- 2-28	4— 5	15.0	50F+50S
16	1- 2-30	3— 4	27.5	85F
3	1-13-30	3— 2	27.3	95F
17	4- 1-30	3— 0	27.1	100F
13	3-24-30	3— 0	27.8	100F
18	7-24-30	2— 9	26.2	95F
2	8-15-30	2— 7	27.5	95F
19	9-19-30	2— 7	28.0	100F
20	12-31-30	2— 4	27.4	100F
21	3-31-31	2— 0	24.5	90F
22	6-29-31	1—10	25.0	90F
1	6-15-31	1— 9	27.1	95F
23	9-17-31	1— 7	26.0	100F
24	12-25-31	1— 5	24.4	90F
4	1-22-32	1— 2	27.6	100F
25	3-24-32	1— 1	25.3	95F
5	8-12-32	0— 6	28.7	100F
6	8-12-32	0— 6	28.5	95F
7	8-15-32	0— 6	28.5	95F
8	2-12-33	0— 1	29.0	100F

"F" refers to the true coffee flavor—freshness.
"S" refers to the flavor produced in coffee by oxidation—staleness.



This standard bottling equipment of the Hemrich Brewing Company has been adapted by the use of convertible shoes and conveyors to handle bottles ranging in size from 12-oz. "Stubbies" to half-gallon jug-like bottles.

Two-Quart Bottles for Beverages

Brewer develops method of handling large containers on standard equipment. Uses detachable appliances

BEER in half-gallon containers runs counter to the present trend to non-returnable, individual service packages. Yet Hemrich Brewing Co., Seattle, Wash., has been selling beer in such containers for more than two years. And their sales in these containers have reached a volume almost equal to one-quarter of sales in standard size bottles.

Half-gallon containers are not newcomers. In the form of jugs and 64-oz. bottles of ordinary glass they have been used for many years by packers of salad oils, syrups, vinegar, cider and wine, to reach markets desiring this form of package. But when they are used for such a product as beer or ale, other things than utility must be considered. The big container must fit into a production schedule set up for the standard size and be strong enough to withstand gas pressure.

In the case of the Hemrich Company, the original desire was to supply draft beer to the home and other points of consumption for which the smallest keg ordinarily used is too large. Another desire was to put beer on the market in a container that would permit selling the most for the least money. Therefore, the large bottle had to be a production item. The ½-gal. bottles must be handled through the plant on a volume production basis.

During the introductory period, steps were taken to develop mechanical means of filling and closing the ½-gal. glass jugs that were the first containers adopted. However, the jug diameter was too great, and the opening was too large to permit handling on the standard filling machine. Also, the large containers would not fit on the plant bottle conveyor.

The filling problem was largely solved by using special castings capable of handling the jugs. These were clamped to the bottle-holding device on the 24-station filling machine. Another change necessary in this machine was the fitting of the filler valve-tubes with rubber crowns or caps which would fit into the mouths of the jugs. These special caps had to have special vent tubes to permit the escape of air while the jugs were filling.

AS a result of these changes, the filling machine was able to handle 24 jugs at a time, the same number as it handled of 1, 1½ or 2-pint bottles. The attachments were made removable, so that the machine could be changed to its original condition.

Finish on the jug openings was not suited to crown seals, so the jugs were corked, and then closed with a screw cap to retain the gas in the beer. These closing operations were kept on a hand basis, and speeded up by the use of a specially-built closing and packing table.

With these aids for handling the jugs, the plant had a production of 150 cases of jugged beer per hour on the average. Without the aids, 60 cases per hour was a good output.

However, solving the problem of protecting the draft beer against spoiling until it was consumed was quite another story. Keeping it continually under refrigeration was effective, but was too costly and not practical for the retailers. And the use of chemicals to preserve it was not advisable. Consequently, pasteurization after filling was adopted.

This heat treatment showed up weaknesses in the glass jugs. They could not stand the temperature changes and gas pressure developed.

To get away from the resulting breakage, took many trials of 64-oz. containers made from various kinds of glass and having various styles of neck finishes. The breakage difficulty was not overcome until the standard style of bottle neck finish was substituted for the jug style of finish and the container was made from glass with better heat-resisting qualities than the glass in standard size bottles.

With the adoption of the standard bottle neck finish, the washing, filling and closing machine difficulties were largely past. With adjustments for the height and diameter of the larger bottle, the standard machines could handle it without the use of the special attachments used for the jugs. The equipment as adjusted for use with the large bottles is shown in the accompanying photograph. This equipment handles all sizes from 12-oz. "Stubbies" to 64-oz. jug-like bottles. Taking all changes into account, it now requires but 30 minutes to make the necessary changes in the machines to go from pint to two-quart bottles.

What Food Advertisers Think of Agency Solicitations

By THOMAS G. MacGOWAN
President, Facts, Inc., New York, N. Y.

AN overwhelming percentage of the 44 food advertisers questioned in our nation-wide survey on advertising believe that advertising agencies are honest in their solicitations, but a fairly large number feel that the agencies are not good at living up to their solicitation claims.

Their attitude on these points is somewhat more favorable to the agencies than is that of the entire group of 225 advertisers studied. While 85 per cent of all the advertisers thought agency solicitations honest, 89.7 per cent of the food advertisers took that view, and while 43.2 per cent of the whole group felt that solicitation claims were not satisfactorily met in practice, the comparable percentage in the food group was only 38.5.

About half of both food advertisers and the whole number of advertisers questioned do not consider agency solicitations well-planned or sufficiently complete to provide a basis for decision. Food advertisers are less anxious than others to receive free general plans from soliciting agencies and more interested in getting specific plans, but they receive both kinds of plans more often than do advertisers in general. They are offered such plans more often than they want them, while advertisers as a whole get them less frequently than they would like to.

Of the food advertisers questioned, 14 were large (spending more than $500,000 a year on advertising); 15 were medium-sized (spending $100,000 to $500,000); and 15 were small (spending less than $100,000).

A substantial percentage of the food advertisers think agencies should give more advance study to prospects' problems.

The reactions to the matter of agencies' good faith in making presentations was very decidedly in the affirmative for all sizes of food advertisers:

	Per Cent
Large food advertisers	84.6
Medium-sized food advertisers	92.3
Small food advertisers	92.3
All food advertisers	89.7

Among all the advertisers the affirmative percentages were: large advertisers, 81.4; medium-sized, 87.3; and small, 85.0.

How well do agencies live up to claims made at the time of soliciting the account? In the food group, a total of 61.5 per cent of the advertisers said either "very well" or "well"; the remainder, 38.5 per cent, said "fairly well" or "poorly." It is interesting to note that more said "poorly" than said "fairly well."

	Per Cent
Very well	28.2
Well	33.3
Fairly well	15.4
Poorly	23.1
	100.0

In the entire survey the responses were divided like this: Very well, 25.8 per cent; well, 31.0 per cent; fairly well, 28.3 per cent; and poorly, 14.9 per cent.

"Do you consider agency solicitations sufficiently complete to give a basis for a decision?" The food advertisers' responses to this question were very similar to those on the proceeding question:

	Per Cent
Most solicitations complete enough	47.5
Most not complete enough	52.5
	100.0

The entire group of advertisers answered as follows: "complete enough," 42.8 per cent; "not complete enough," 54.5 per cent; and "about half are complete enough," 2.7 per cent.

"DO you think agencies should be expected to submit free speculative general plans?" In the food group the affirmative responses totalled 69.2 per cent of the whole, while in the entire survey the percentage was 70.0. All size groups among food and other avertisers gave pluralities to the affirmative view.

"Do most agencies soliciting your account present general plans?" In the food group we find that more of the advertisers than want them—72.5 per cent of the 44 responding—receive free general speculative plans. In the whole survey only 58.8 per cent of the responders receive them, indicating that 13.2 per cent of the advertisers would like such plans but do not get them.

"Do you think agencies should be expected to submit free speculative specific plans with layouts and copy?" In the food group 51.3 per cent of the advertisers said "yes," while 46.7 per cent of the entire number questioned responded in the affirmative.

"Do most agencies soliciting your account present specific plans?" Food advertisers gave an affirmative response totalling 34.2 per cent; all advertisers one of 29.6 per cent. In the food field the greatest disparity between the number who wanted to receive specific plans and those who got them was found among the medium-sized advertisers; in the whole survey the small advertisers were the least satisfied on this point.

"Do you ever ask agencies which have not solicited your account to present plans?" The results for food advertisers and the entire survey were closely comparable. In the former group 20.0 per cent of the men questioned said they did ask for plans from non-soliciting agencies, while in the whole investigation 21.7 per cent of the responders gave affirmative answers. These percentages held good, in the main, for all size groups.

"What ideas, if any, have you for the improvement of agency methods of solicitation?" A tremendous variety of suggestions were given to the investigators in response to this question. The one most frequently vouchsafed was: "The agency should get a better advance knowledge of the prospect's problems." This accounted for 43.5 per cent of the food advertisers' suggestions, and for 47.0 per cent of those offered in the entire survey. Other suggestions most frequently advanced were: "solicitations should be more specific and factual" (food, 12.9; whole survey, 23.9), and "they should be more conservative and modest" (food, 4.3; whole survey, 5.8).

Food Packages and Products

Pull-Out Butter Pats. The height of consumer convenience has been incorporated in a butter package put on the market by Rochester Packing Co., Inc., Rochester, N. Y. This comprises a 1-lb. package consisting of the customary four pieces, each of which comprises ten "pats." A strip of parchment paper is inter-leaved, accordion fashion, between the pats, so that the consumer merely pulls the end of the strip to remove as many pats as desired.

The Rochester Packing Co. has also put on the market a new meat product known as "Deep Sea Loaf," a meat loaf made of deep-sea haddock.

Shock-Frozen Oysters. A freezing process so rapid that it has been called "shock" instead of "sharp" freezing has been developed by Matagorda Bay Oyster Co., Houston, Tex., for freezing packaged oysters. After having been cleaned and chilled in ice water, the oysters are packed in special containers and "hermetically" sealed. They are then put into wire racks and submerged in rapidly circulating brine at a temperature of —20 deg. F. After freezing, the packages are transferred to dry storage at —10 deg., where they may be held indefinitely. Specially constructed "carbon ice" shippers are employed in delivering the product.

110-lb. Paper Bag. The multiwall paper bag used by Standard Brands, Inc., New York, for "Arkady," a dough improver, recently won the bronze award in the shipping container class of the All-America Package Competition. Now it is in production and is being shipped to all parts of the country. This package is outstanding in that it uses a special high-strength, moistureproof material as one of the five walls. This material consists of fibers interwoven between moistureproof sheets of kraft paper, the fibers preventing tearing.

Apricot, Cherry Juices. Two new fruit juices, apricot and California black cherry, have been put on the market by California Fruit Foods Co., Los Angeles. The apricot juice has a tartness giving it appetite appeal, and it contains vitamins A and C. The cherry juice is a thick-bodied liquid similar to grape juice. It is intended as a straight beverage or as a mixer in cocktails or punch. In the way of vitamins it contains A, B and C. Both products are vacuum packed in special, enamel-lined tin cans.

Trick Ash-Tray Jar. Already popular as a package for condiments and hard candies, the ash-tray type of container has been improved. As used by Nash Underwood, Inc., Chicago, it is provided with a lid equipped with a trap door. This door opens to let the ashes fall into the jar and then automatically closes to keep in smoke and odor. The only label on this package is a narrow, curved band on the side of the jar.

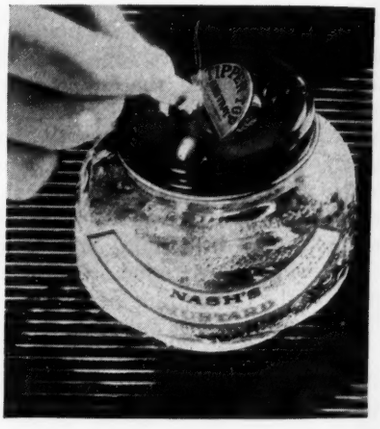
Flavors for Foods. A new line of flavors said to be highly economical have been brought out by Fries & Bros. and are distributed by Ross & Rowe, Inc., New York. To demonstrate the quality of the product, the distributors are sending out samples of hard candy made with it.

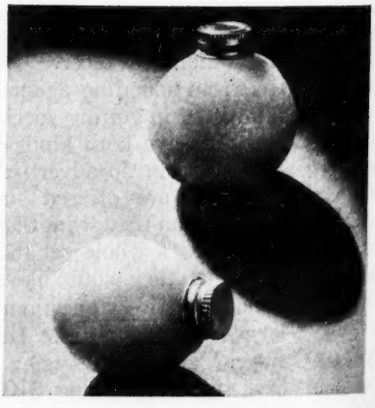
"Fruit" Is Container. Something quite novel in the way of a container is that employed by Molded Products Co., Buffalo, for "Wonder Fruit" crystals. The container is made with the size, shape, color and surface characteristics of oranges and also lemons. Of wax composition, it has a short neck onto which is screwed a metal cap. The label has a hole in the center and is slipped over the neck.

Modernized Package. By way of bringing its food-color package up to date, McCormick & Co., Baltimore, has changed the individual containers from vials to square bottles, included four colors in one carton and put in a dropper for consumer convenience. The square bottles do not topple over easily, and the dropper enables the colors to be mixed. The carton is of open-face construction, with modern design and easily read lettering.

Fish in Parchment. Codfish wrapped in vegetable parchment retains more moisture and loses less salt than in other types of packages. These are conclusions drawn by Pacific Coast Codfish Co. and Coffin Fish Co., Seattle, from a series of tests. Consequently, both concerns have adopted vegetable parchment wraps for their codfish.

Grapefruit Vinegar. Another citrus byproduct has been developed by Shary Products Co., Mission, Texas. This new addition is a grapefruit vinegar, which is distinguished by a deli-



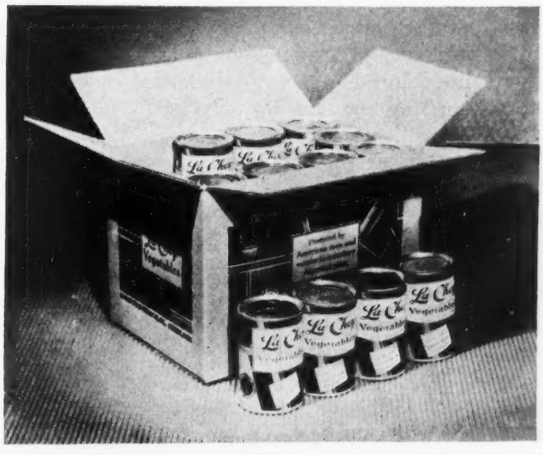


cate green color. About 2,000 gal. is ready to be placed on the market.

Ice Cream Flavor. "LaCoa Kreme of Kokonut" is a liquid coconut flavor brought out for dairy and other food industries by Dairy Beverages, Inc., New York. According to the manufacturer, the flavor enriches milk and imparts to it a refreshing taste. The fountain trade is using it in milk shakes, sodas, malteds and as toppings for sundaes.

Attractive Package. Simplicity has been utilized to attain attractiveness in the new container for paprika and celery salt adopted by D. & L. Slade Co., Boston. A straight-sided glass jar of fluted design and amber color has been finished off with a wide, shaker-type closure of green enameled aluminum. The label, also in green, comprises a small rectangular piece which enhances the attractiveness of the package rather than dominates it.

Jelly in 60-lb. Pail. To effect a reduction in the cost of its jelly without sacrificing quality, Max Ams, Inc., New York, decided to put the product up in twice as large a container. Already the company was using 30-lb. wooden pails for the jelly, so it adopted a 60-lb. pail. In addition to a lower container cost, there is a saving in production expense. One series of mixing operations suffices where two would be required if the 60-lb. batch were put up in two 30-lb. pails.



Canned Wine. The long prophesied wine in tin cans has made its appearance on the market. Introduced by Wine Packing Corp., Stockton, Calif., the new container holds 12 oz. and retails at 20 cents. The wine is protected against contact with the can itself by a double coating applied at the cannery to the type of beer can which is closed with a crown cap. Both major can manufacturers insist they have not yet developed a satisfactory container for wine, and are watching the experiment.

Decorated Shipping Case. Believing that the shipping case can sell merchandise as well as transport it, La Choy Food Products, Inc., Detroit, has adopted a shipping box of colorful design. Printed in red and black, the design is of Chinese motif, corresponding to the labels on the can. In the grocery, one case is stacked on top of another and the top one opened, this making a floor display.

Cocoa in Bags. For the first time, Hershey Chocolate Corp., Hershey, Pa., is packing Dutch process cocoa in less than 5-lb. cans. Five different brands of this product are now being sold in ¾-lb. paper bags, as are three brands of natural, or American, process cocoa. The bags are of the type used for coffee and are lined with 30-lb., amber glassine, grease resistant. Twelve are put into a shipping carton. An advantage of this package is that each bag contains the quantity necessary to make one batch of syrup. The container is not intended for the home market, but for soda fountains.

Aluminum-Lined Bags. Bags lined with aluminum foil are the latest thing in packages for tea and coffee. This type of container retains the flexibility and economy of regular bags while being of distinctive appearance. One bag, typical among those illustrated, has an inner liner of glassine paper. The foil is mounted to this paper with the metal side out, and an additional transparent paper wrap covers the foil. The printing usually is done on the wrap, with the aluminum as the background, although in tea bags, the foil is used next to the tea. A tin tie attached to the top makes tight reclosure possible. This, together with the reflection of heat and light by the foil and the use of moistureproof paper gives a package said to keep coffee or tea in a fresh condition.

PROMOTING *the Product . . .*

▶ PHILLIPS PACKING Co., Cambridge, Md., did something new in product promotion last month in the way of the first "telegraph convention" ever held. The purpose of this convention, in which messages from the advertising department were telegraphed to thousands of customers, was to sell distributors at least five new varieties of Phillips products. A national sales drive was launched in conjunction with this convention.

▶ OYSTER GROWERS' AND DEALERS' Association of North America will continue throughout the 1936-37 season the promotional campaign undertaken last year. About $100,000 will be spent.

▶ GOLDEN MILK FARMS, Bellflower, Calif., is boosting sales by distributing milk in half-gallon and one-gallon bottles. These containers are sold from a store located at a point which 60,000 automobiles pass daily. Only guaranteed raw milk is sold. This service supplements, but does not replace, the regular route service.

▶ AMERICAN CAN Co., New York, has issued a booklet, "More About Canned Foods for the Home Economist," giving information on 25 canned foods which will be helpful in teaching greater appreciation of those products. The booklet also gives information about the tin can.

▶ NATIONAL DAIRY CORP., New York, has issued, under the "Sealtest" label, a recipe book giving 150 new ways to serve ice cream. The book is being offered in national magazine advertising. Illustrated with color photography, the book contains more than 60 pages.

▶ H. H. KEIM Co., LTD., Nampa, Idaho, is building meat sales by continually stressing quality rather than price in advertising. And the company concentrates on one product for four to six weeks.

▶ MILK INDUSTRY FOUNDATION, New York, tells the story of the milk industry from the farm to the consumer in a pocket-size booklet "Milk for Millions." The book points out the care with which milk is handled during processing and distribution.

▶ NATIONAL SUGAR REFINING Co., New York, introduced last month, and will continue through July, advertisements featuring the advantages of "Jack Frost" powdered sugar for use in beverages and with fruits and berries. Instant melting is the quality stressed.

▶ OWENS-ILLINOIS GLASS Co., Toledo, has mailed to leading vintners attractively colored grocery-window posters featuring the serving of wine with cheese and crackers. A special news article on serving wine has been released to 1,000 newspapers.

▶ INTERNATIONAL SALT Co., Scranton, Pa., tells a complete and interesting story of the manufacture of salt in an attractively and profusely illustrated booklet, "Salt Empire."

▶ WISCONSIN CHEESE PUBLICITY ASSOCIATION will embark early this month on a national advertising and publicity campaign. Assessments of 1 per cent on monthly milk checks of farmers and on incomes of cheesemakers will finance this promotion.

▶ WILSON & Co., Chicago, is planning a newspaper campaign which is to be one of the largest in its history.

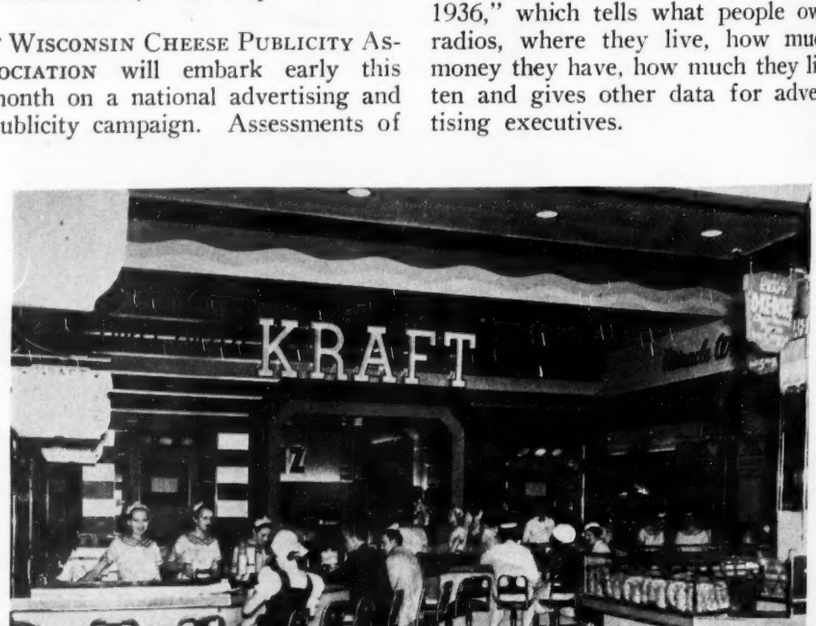
▶ SHEFFIELD FARMS, New York, a National Dairy subsidiary, is stressing in newspaper ads the fact that it spends $300,000 annually to protect the purity of its milk.

▶ NATIONAL BROADCASTING Co. has completed a survey revealing that there are 3,000,000 radio cars.

▶ BEECH-NUT PACKING Co., H. J. Heinz Co., Fairmount Creamery, Cleveland Home Brewing Co., Coca-Cola Co., Quality Ice Cream Co. and Cleveland Ice Cream Co. are promoting their products by exhibits at the Great Lakes Exposition, Cleveland, June 27-Oct. 4.

▶ BORDEN Co., New York, stimulated sales of its Chateau cheese during June by three ads a week in newspapers and by window displays, floor "dumps," sample cards and demonstrations.

▶ COLUMBIA BROADCASTING SYSTEM announces a publication, "Radio in 1936," which tells what people own radios, where they live, how much money they have, how much they listen and gives other data for advertising executives.



KRAFT FEEDS THE TEXANS

At its exhibit in the Hall of Foods and Beverages at Texas Centennial Exposition, Kraft-Phenix Cheese Corp. does more than display its products. It serves them—and gets paid for them, too. Through the doorway may be seen a portion of the Heinz exhibit.

Controlling Production and Materials

By **FRANCIS CHILSON**
Production Engineer, New York, N. Y.

A MANAGEMENT FUNCTION OF FOOD ENGINEERING

Controlling Production

► Production requirements are determined by sales expectations and results. These change from month to month, or from period to period. Unless supplies of materials closely parallel these changes, shortages may occur that will delay production, or supplies of materials on hand may build up to a point that uselessly ties up working capital which is needed elsewhere. This article explains a system for coordinating sales, production and the purchase of materials in such a way that trouble is avoided.—Editor.

This is No. 2 of a series on the management functions of food engineering.

CONTROL of packaging supplies (see FOOD INDUSTRIES, March, 1936, page 129) is simply a part of the general problem of production control. But somehow, packaging materials have a way of holding up the procession. Recently I checked over the inventories of a large food company and discovered that while a sufficient number of cartons were on hand to provide for the next thirteen years, there were not enough bottle caps to seal the bottles that went into the cartons to provide for the next day's run. This is by no means an extreme case. In one instance I discovered a label supply large enough to provide for the next 75 years at the rate the item was then selling.

Usually these dead items are still carried in the line in the forlorn hope that some day, by an act of God, sales may pick up enough to use up at least a part of the over-bought packaging supplies. Many sales officials are afraid to make cancellations on the proper scale because the wholesale write-off of special packaging materials puts a dent into profits that causes directors to ask embarrassing questions. Salesfolk don't mind strutting a bit before the board when an item has been an outstanding success, but they are usually a bit reluctant about hauling out skeletons from that limbo of bad guesses—the packaging material warehouse.

Every extensive line has these skeletons. You will notice that we did not qualify that remark. These skeletons are the result of the hysterical optimism of the sales department, the false economy of the purchasing department and the lack of a complete control system in the production department. When a new item is introduced, its sales potentialities are always estimated in the millions by the sales department. In buying the necessary packaging materials the purchasing department discovers that the company can make no profit on the item if it purchases supplies on a production requirement of less than a million. It also discovers that the necessary packaging materials can be had for practically nothing on a basis of five million. A hurried conference with the sales department . . . and five million it is.

SO MUCH for the item that fails to make the grade. On a lesser scale the same thing is substantially true of the items that do make the grade, because of the lack of an integrated control system. The difference between a complete control system and the usual variety is that, in the former case, the production manager has in a correlated, centralized form every last detail concerning every item manufactured in the plant. In the haphazard plants the necessary information is not correlated, and may not even be accurately recorded at all. In my experience, I have never seen an integrated system fail. By means of it inventories can be controlled, and production scheduled with military precision.

Production and packaging control has the definite purposes of servicing sales and limiting raw material, packaging material and finished stock inventories, and hence, the investment in them. A manufacturer who is satisfied to operate his business with a half million dollars in inventories when a hundred thousand would do, is not wise. In this case all he does to avoid back orders is to keep minimum limits set so high that never less than two or three months stock is carried at any time. This is the easy way out; it requires neither intelligence nor effort. And surprising as it may seem, many businesses are operated on this basis. A well-known condiment maker recently told the writer that he had never suffered a back order since he put his new system in. The "new system" it turned out was a system of minimum limits that did not permit stocks to run below a three months' supply.

Scientific production control em-

FINISHED STOCK
COMMENTS
NO
LOT
OPERATING DATA
UNITS
TIME
MONTH
SALES STATISTICS GROSS
PREVIOUS YEAR
ESTIMATED SALES
ACTUAL SALES
MINIMUM STOCK
INVENTORIES AND PRODUCTION GROSS
INVENTORY
ESTIMATED
ACTUAL
PRODUCTION
PLANNED
ACTUAL
COST
NAME
CONVERSION FACTOR
JAN.
FEB.
MAR.
APR.
MAY
JUNE
JULY
AUG.
SEPT.
OCT.
NOV.
DEC.
PACKAGING MATERIALS
COMMENTS
PACKING
DEL TIME
CONTRACTS
DATE
ORDER NO.
QUANTITY
CONTRACT BALANCES
JAN.
FEB.
MAR.
APRIL
MAY
JUNE
JULY
AUG.
SEPT.
OCT.
NOV.
DEC.
YIELD
MINIMUM STOCK
INVENTORY
COST
NAME
CONVERSION FACTOR

PRODUCTION STATISTICS
MASTER SHEET
YEAR
NAME OF ITEM
FINISHED RAW MATERIALS
UNFINISHED RAW MATERIALS
CONTRACTS
CONTRACT BALANCES
COMMENTS
PACKING
DEL. TIME
DATE
ORDER NO
QUANTITY
JAN.
FEB.
MAR.
APRIL
MAY
JUNE
JULY
AUG.
SEPT.
OCT.
NOV.
DEC.
YIELD
MINIMUM STOCK
INVENTORY
COST
NAME
CONVERSION FACTOR
LOTS
NO.
QUANTITY
TIME
OF PROC.
TIME CYCLE
AVERAGE YIELD

bodies never having a stock in excess of a reasonable safety factor. Such a safety factor is simply the difference between an arbitrary sales expectancy for a given month and productive capacity, plus an arbitrary 25 per cent. In other words, if sales expectancy for the coming month is 1,500 gross, and plant capacity is 1,200, it will then be necessary to have on hand at the beginning of the month 700 gross.

The only difference between a production control system for one kind of plant and another lies in its urgency and not in its principle. Thus a bakery plant plans its production at night for the following morning. A confectionery plant plans for the following seasonal period. A preserve plant may plan its production for the following year. All this is a question of degree or urgency. Each must know what it expects to sell. It must know its plant capacity. It must know the quantity of each raw and packaging material on hand. Therefore, all this information should be centralized at one point, under the supervision of one man.

The system and the records we shall describe were designed originally for a drug plant and since have been adapted to a confectionery plant and a food plant with equally good results. In effect it is a perpetual inventory system combined with a statistical planning system. It is based on the idea of centralizing every last detail concerning the manufacture of each item, together with all the raw and packaging materials that become a part of that item. Some readers will get the reaction that this system is unnecessarily detailed and that it involves a lot of clerical work. Actually it does not work out this way once it has been set up. It is well to remember that somebody must do the detail work, regardless of whether it is done at one point or at many points throughout the plant. As far as the amount of clerical work is concerned, this system reduced the number of clerks in one production department from thirteen to three; in another from eight to one. It takes quite a bit of work to set it up because the statistical data required by the Master Sheet is usually unknown, even to the production manager himself. A sensible plan is to have all data prepared a month or two in advance of the end of a fiscal period, so that when the physical inventories are taken, all that need be done to put the system into operation is to enter them on the sheets.

THE system utilizes a pair of facing pages, reproductions of which are shown with this article. One of these pages, the left-hand one, is called the Master Sheet and contains all the statistical data required to plan production for any given month, for any single item of production. This sheet remains in the binder for an entire year. The second of these sheets, the right-hand one, is called a Monthly Production Schedule Sheet and is concerned with the running of inventories of raw and packaging materials; with purchases and receipts, and with production orders for the manufacture of a specific item. In this case the Master Sheet and the Monthly Production Schedule are concerned with one item only. The Monthly Production Schedule is replaced every month. In some applications, however, the sheet is ruled up in such a fashion that it will serve for three months. It will be observed that names of individual inventory items appear on the Master Sheet, the Monthly Production Schedule being concerned only with figures relating to these items.

The Master Sheet and the Monthly Production Schedule are divided into four sections: Finished Stock, Packaging Materials, Finished Raw Materials, Unfinished Raw Materials. The latter section is included for the purpose of segregating those raw materials that of themselves require processing before they can be used. A case in point is cocoa beans which are unfinished raw materials because they must be processed to produce cocoa butter, coatings, or cocoa powder. These in turn are considered finished raw materials because they are ready for use in producing the finished product.

The Master Sheet is punched at the right side so that, when placed in a binder, it forms the left-hand page, whereas the Monthly Production Schedule is punched at the left side, so that when in a binder, opposite the proper Master Sheet, it will constitute the right-hand page. The names of the individual items appear on the right of the Master Sheet so that they will be adjacent to the Production Schedule. This avoids the necessity of having a name column on the Production Schedule and hence the necessity of re-writing individual item names every month.

The finished stock section of the Master Sheet is subdivided into columns and groups of columns. The first of these, on the left side of the page, is headed Comments, and is used for the purpose of recording detailed manufacturing and packaging operations, etc. Next to this there is a group of six columns under the general heading, Operating Data. This in turn is separated into two divisions, Lots and Time, respectively. The first of these divisions deals with lots or batches, and the columns in this division provide for entering data regarding the number of lots or batches that are made at one time; the total weight of these batches and the number of gross of finished packages the batches will produce. The second division, Time, provides columns for entering the over-all time (Time Cycle), which is the elapsed time required for processing operations that need no labor, such as drying, aging, etc. The second of these columns provides space for entering the number of operators required to make a given batch or batches and the amount of time in hours. The third column gives similar data as to number of operators and time required for packaging operations. When manufacturing and packaging time must be broken up into individual operations, the nature of each operation is stated in logical order in the Comments column.

By looking at the Operating Data section of the Master Sheet, the production manager can see at a glance the batch standards in weight or gallons, and the time required to manufacture and package the batch or batches.

NEXT we move across into the Sales Statistics subdivision. In this subdivision for each month sales in gross are given for the previous year. In the next column, estimated sales for the current year are entered at the time the sheets are made up from the "guess sheet" furnished by the sales department. Then we have actual sales for the current year which are entered monthly from a report furnished by the accounting department. Finally we have minimum stock, which is included for the purpose of calculating stock minima based on seasonal requirements. Thus, in January a minimum stock of a hundred gross may be sufficient, whereas a thousand may be the required minimum in May.

The next subdivision is devoted to Inventories and Production. Normally an estimated inventory is not required, but as these sheets were designed for a plant operating under a budget system, an estimated inventory column was included for financial forecast purposes. The figures

in the Actual Inventory column are obtained from the Monthly Schedule Sheet. The Production subdivision of this section shows a column for Planned and Actual Production. The former is a forecast made at the beginning of the year. The latter is current data obtained from the Schedule Sheets.

The next subdivision shows standard costs, names of individual items and the conversion factor, which is the formula. Reference will again be made to these columns.

THE next section of the Master Sheet has to do with packaging materials. Reading from left to right this section has a comments column; next a column to show how the packaging materials are packed, whether in cases, drums, etc. It has a column to show the length of time required for delivery of a particular item. Then it has subdivisions devoted to Contracts and Contract Balances. The first shows the date, number and quantity of the original contract, a copy of which is received when placed by the purchasing department. The Contract Balance section shows the monthly balances of the original contracts. These balances are arrived at on the Production Schedule by deducting shipments from the previous month's balance.

Ordinarily the control of contract balances is left to the purchasing department. This is unsound, because if the production manager is faced with a sudden spurt in sales as in the case of a special deal, he must know, if he is short of a particular material, whether there is enough on contract to enable him to get a rush shipment. The control of contract balances at this point provides a useful check on the purchasing department, which should not be permitted to renew a contract until it first hears from the production department about probable future requirements or the possibility of discontinuance.

In addition to this section we have a yield column, which is included for items which are bought on one basis and used on another, as for instance, paper wrappers bought by the pound and used in pieces. It also makes provision for indicating how many gross of packages can be wrapped from a roll of wrapping paper.

Then we have minimum stock and inventory columns, by item, of course, and at the extreme right-hand side, columns showing standard cost of each individual item and the names of each item.

In this section, in proper order, all packaging materials are listed as, for example: bottles, caps, front labels, back labels, neck bands, carton wrappers.

THE Finished Raw Materials section contains exactly the same column headings as the Packaging Materials section. But in the extreme right-hand column, Conversion Factor, the formula of the product is stated in percentages.

The Unfinished Raw Materials section has the same purchasing data with reference to contracts, etc., but it also has a subdivision showing statistics regarding batch sizes, time cycle, yield per lot, etc., which are necessary to determining the length of time required to convert unprocessed raw materials into finished, usable raw materials.

On the Master Sheet, therefore, all details, properly segregated, are placed before the production man, enabling him to plan intelligently.

Now we come to the Monthly Production Schedule wherein statistical data is employed to produce goods. It has exactly the same sections as the Master Sheet, the horizontal rulings matching exactly.

The Finished Stock section of this sheet shows, first of all, the Beginning Inventories of work in process and finished goods. Next we have a subdivision for Planned Production, showing the date wanted, the number of lots or batches, the number of pounds or gallons and the number of gross of finished packages.

By referring to the Beginning Inventories and the Estimated Sales on the Master Sheet and also to the Minimum Inventory required for the succeeding month, the production manager can readily determine how many gross and, hence, how many batches he will be called upon to make. These figures he jots down above the heavy ruling at the top of the sheet.

This total he then splits up into daily production in the Planned Production subdivision, using the Operating Data from the Master Sheet to guide his judgment in determinng when and how much to produce each day.

Having done this the production manager's work is finished for the month excepting for check-up purposes. The rest of the work can be done by a clerk.

The next subdivision of the Finished Stock section is devoted to Finished Production. The data posted in this is obtained from daily work reports sent to the production office by operating departments. By comparing this column daily with the Planned Production column, the production manager can tell whether the plant is meeting requirements. By making a comparison with the Daily Sales column at the extreme right of the page, which is based upon a report supplied by the accounting department, the production manager can tell whether to increase Planned Production or reduce it.

The next column, Returns, is primarily used for recording returned goods that are not damaged in any way and can be returned to stock directly. Data for this comes from a daily report submitted by the accounting department. The Pounds or Gallons division of this column is used for recording the return of bulk goods or the return of goods transferred to other departments, in those cases where a particular material is used as a basis for several different finished products. Thus, mayonnaise might be transferred to another department when it is mixed with other ingredients to form a special kind of salad dressing. Any that might be left over would be returned to the mayonnaise department to be packaged in the regular way. Space is provided, therefore, to record such transfers and returns.

The Transfer column has partly been explained above. Sometimes bulk goods are transferred from one department to another or finished goods are transferred in the same way, as for instance in making up assortments.

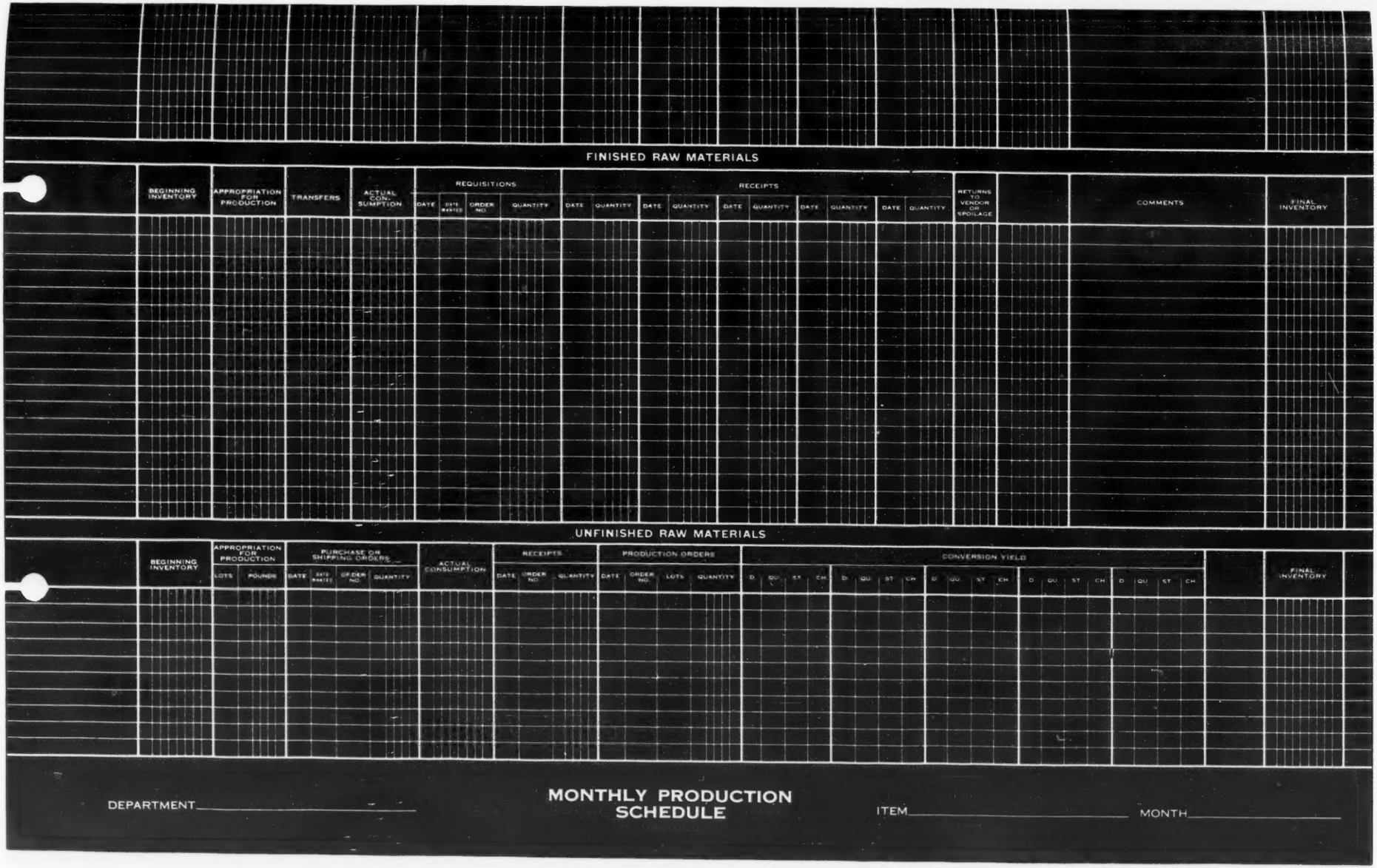
Free Goods and No Charges shows the results of special deals and replacements and is obtained from an accounting department report.

In order to arrive at Final Inventories, the Beginning Inventories are added to Actual Production and to Returns. From the total of these is deducted the total of Transfers, Free Goods and Daily Sales. This is not done daily, of course, unless the production manager has some special reason for wanting to know what his running inventories are. Usually it is done once a month by using the totals of the respective columns.

NOW we shall go to the Packaging Materials section of the Monthly Production Schedule.

The figure entered at the top of the Planned Production column in the Finished Stock section, which is the planned production total for the month, is brought down into the Pack-

FINISHED STOCK
BEGINNING INVENTORIES
LOTS
NO
LBS OR GAL
FINISHED STOCK
PLANNED PRODUCTION
DATE
NO LOTS
POUNDS OR GALLONS
FINISHED GROSS
FINISHED PRODUCTION
NO LOTS
POUNDS OR GALLONS
FINISHED GROSS
RETURNS
POUNDS OR GALLONS
FINISHED GROSS
TRANSFERS
POUNDS OR GALLONS
FINISHED GROSS
FREE GOODS OR CHARGE GROSS
DAILY SALE GROSS
COMMENTS
FINAL INVENTORIES
NO LOTS
POUNDS OR GALLONS
FINISHED GROSS
PACKAGING MATERIALS
BEGINNING INVENTORY
APPROPRIATION FOR PRODUCTION
TRANSFERS
ACTUAL CONSUMPTION
REQUISITIONS
DATE
REQ. NUMB.
ORDER NUMB.
QUANTITY
RECEIPTS
DATE
QUANTITY
RETURNS TO VENDOR OR SPOILAGE
COMMENTS
FINAL INVENTORY



FINISHED RAW MATERIALS

BEGINNING INVENTORY	APPROPRIATION FOR PRODUCTION	TRANSFERS	ACTUAL CONSUMPTION	REQUISITIONS				RECEIPTS								RETURNS TO VENDOR OR SPOILAGE		COMMENTS	FINAL INVENTORY
				DATE	DATE WANTED	ORDER NO.	QUANTITY	DATE	QUANTITY	DATE	QUANTITY	DATE	QUANTITY	DATE	QUANTITY				

UNFINISHED RAW MATERIALS

BEGINNING INVENTORY	APPROPRIATION FOR PRODUCTION		PURCHASE OR SHIPPING ORDERS				ACTUAL CONSUMPTION	RECEIPTS			PRODUCTION ORDERS				CONVERSION YIELD																FINAL INVENTORY
	LOTS	POUNDS	DATE	DATE WANTED	ORDER NO.	QUANTITY		DATE	ORDER NO.	QUANTITY	DATE	ORDER NO.	LOTS	QUANTITY	D	QU	ST	CH	D	QU	ST	CH	D	QU	ST	CH	D	QU	ST	CH	D	QU	ST	CH	

DEPARTMENT_____

MONTHLY PRODUCTION SCHEDULE

ITEM_____ MONTH_____

aging Materials section by the clerk who runs the record and becomes an Appropriation for Production. "Appropriation" means the amount of each packaging material required or earmarked for the given month's production. This total is entered in the Appropriation column beside the Beginning Inventory column of the Packaging Materials section. Comparison of Appropriations and Inventories indicates whether there is sufficient of each individual packaging material on hand. If there is not, the Master Sheet is consulted to see whether there is a contract outstanding for the short item, and a requisition against this contract is made on the purchasing department. A copy of this requisition is entered in the Requisition Column, showing date it was placed, and when the item is required, and then it is filed in a follow-up.

Next to the Requisitions column is a section for Receipts, data for which is based upon copies of receiving tickets supplied by the receiving department. Room for five different shipments against each order is provided.

Next there is a column for packaging materials spoiled in production and for defective material rejected and returned to the supplier.

The Final Inventory at the extreme right of the page is arrived at by adding Receipts to Beginning Inventory and deducting Transfers, Actual Consumption and Returns to Vendor.

The next section, Finished Raw Materials, is exactly the same as the Packaging Materials section in so far as rulings and data are concerned. The only difference is that the Appropriation for Production is based on pounds or gallons instead of gross. Here the conversion factor comes into play. On the Master Sheet this conversion factor is stated on a percentage basis. Therefore, all the clerk has to do is multiply the total number of pounds or gallons required (Planned Production) by the percentages (conversion factors) of each item in the formula to get the Appropriation for raw materials. Comparisons are then made with stocks on hand in exactly the same way that packaging materials are compared.

The last section, Unfinished Raw Materials, shows a beginning inventory of raw materials awaiting processing. The Appropriation for Production in this case comes from the Finished Raw Materials subdivision. If the comparison of finished raw material inventories and production requirements indicates a shortage of a raw material, which must be processed before it can be used, an appropriation is made against the proper unfinished raw material in the Unfinished Raw Materials section. An order for processing is then entered in the Production Order column, showing date wanted, number of lots to be run, and any other necessary information.

IF IN such an instance a comparison of Appropriation and Beginning Inventory shows an insufficiency of unfinished raw materials, a requisition or shipping order is issued against outstanding contracts in exactly the same way that packaging materials are handled, provision being made for recording receipts.

The Conversion Yield section of this subdivision shows the yield of Finished Raw Materials from each lot of Unfinished Raw Materials. In the case of cocoa beans, cited above, cocoa butter would be one finished raw material, cocoa powder another and chocolate coating still another. In the case of chocolate coating, powdered sugar would be added to the liquor and would have to be included in the total yield. The yields of individual raw materials are transferred to the Finished Raw Material section above as Receipts and of course are included in the final inventory calculation.

This brings every item of raw and packaging materials, together with all the details involved in their handling, under the absolute control of one man, the production manager. Nothing is omitted. No other, subsidiary records are required to plan production for the factory. On these two sheets he can see at a glance the entire production picture. It is a simple system and can be operated by any clerk or stenographer. In three different plants where the writer installed the system, it was operated by girl clerks. It relieves the production manager of all routine work and calculating, with the exception of actually planning the production and of checking the performance with the plans.

THIS system lends itself to many modifications. The different sections have been split up into four separate records. The Monthly Production Schedules have been perforated in such a manner that the sheets for all twelve months were kept in a binder for comparative purposes, with the Final Inventory column on one month's sheet forming the Beginning Inventory of the succeeding month's sheet.

This system contains nothing that is not always done in planning production and controlling inventories in every plant regardless of what is made. In some plants the work is done by many individuals in different departments and finally correlated by the production manager. In some plants part of the work is done accurately; the rest is guessed at. When the system is carried out faithfully in principle, regardless of how the information is recorded, back orders are avoided and inventories are kept at a safe minimum because the production manager knows what he has to work with; he knows what is coming in; he knows what is going on in the factory; he knows how well actual sales are meeting estimates. Hence, he can step on the brake or the accelerator as required.

TEMPERATURE CONTROL FOR CONTINUOUS PROCESSES

In the May, 1936, number of Food Industries the "Blue" section was devoted to a discussion of instruments and methods useful for controlling the temperatures of batch processes in the food industries. Next month, the discussion of temperature control will be continued with another "Blue" section, this time dealing with the instruments and methods suitable for use in controlling continuous processes of food manufacture.—Editor.

EVERYDAY Operating Problems

OF FOREMEN, SUPERINTENDENTS, PRODUCTION MANAGERS

Common Sense vs. Science

SOMETIMES it is easy to forget common sense in an effort to bring all forms of knowledge to bear on our troubles. This seems to be especially true of scientific knowledge. While chemistry, physics and bacteriology are very useful tools around the food plant, they cannot take the place of common sense. Here are a couple of examples of what is meant.

Mystery of Hollow Pickles

For years everybody in the pickle business had wanted to know what caused hollow pickles. The loss these pickles caused was so great that everybody studied the question. Something queer and hidden was thought to be happening during the fermentation. Only a few years ago, a man who was *not* a chemist started to make old style pickles on a factory scale. For the first time a pickle manufacturer saw the insides of thousands of cucumbers before they were put into the fermentation tank, because to make old style pickles, the cucumbers must be cut up while raw.

He found that many of them were hollow. They grew that way! And now there isn't any mystery any more about what makes hollow pickles.

Mystery of the Sour Batter

Something like that once happened in a baking plant, in the ice cream cone department. Always after a long hot spell, they noticed that the cones baked out white instead of brown. Then somebody discovered that the cause of the white cones was sour batter. But up in the front office nobody could figure out why the batter could go sour because it was made fresh every hour. So a chemist was started on the job to find out what made the batter turn sour so quickly on very hot days.

This chemist happened to be very lucky. An Italian workman named Mike took a liking to him and, after a few days, put him wise to the fact that the janitor on the nightshift was lazy and never cleaned out the batter tanks on the cone machines. On cool nights it didn't seem to make any difference, but on hot nights it was something else again. The tanks were up, about 6 ft. off the floor. You could not see into them. The unused batter soured overnight, so that in the morning there was about a pint of sour mess in the bottom of the tanks. That made a swell "starter"—for the fresh batter. And on a very hot day the batter soured by two o'clock in the afternoon.

That was something that the chemist might not have found out for some time, without Mike's help, because the batter man came to work at 5:30 in the morning, the foreman and his gang started work at seven, and the chemist seldom got there until eight o'clock.

The reason why Mike never told his boss about the sour batter on hot mornings was because the foreman was a hard-boiled know-it-all. He didn't want anything out of his help but silence, and damn little of that. He got it. Also he got a new job, elsewhere. So did the janitor.

Common sense is a very valuable article around a plant.

Foreman Misses Big Opportunity

LAST week we heard about a big lot of spoilage that could have been prevented by the foreman of a department. He could have saved his company several thousand dollars if he had requisitioned new thermometers when the old ones were broken. But he didn't understand what the thermometers were for. So he figured that new ones were of no use. And his superintendent either was Scotch, or didn't know, or else didn't realize that the thermometers had been broken for years, until a great quantity of goods spoiled. He also missed a big bet.

These were ordinary mercury thermometers made to screw into a tank. They were there to check against the recording thermometers that also operated the temperature controllers. The foreman, unfortunately didn't realize that a recording thermometer is adjustable. He didn't know that you set it to read the right temperature by looking at the reading of the mercury thermometer. Both of them should always read alike. If they don't something is wrong.

Busted for Two Years!

But in this case, the mercury thermometers had been broken for a long time—considerably more than two years—and the recording thermometers had slowly gotten out of adjustment. Nobody knew it until the goods spoiled. And then there was hell to pay.

All these checks and double checks are put in for a purpose. Lots of times you can get away with it, even if they are missing, just like a lot of people drive a car without a spare tire, and get away with it for months. But there always comes a time when it is needed and it's usually too late. The damage is done.

The food business is different from any other kind of business. Foods will spoil. Most other things don't spoil. Correct temperatures are often necessary to prevent spoilage. When temperatures are very important it is wise to have two ways to measure them. And both thermometers should always check. Smart production managers usually have someone check up on thermometers and control instruments every little while. They want to be sure that they are there, and that they are correct. This is because sometimes even mercury thermometers have been known to be a little off after years of service. And where the ordinary liquid-in-glass thermometers are not installed, the equipment should at least be provided with wells to permit them to be used for periodic checking.

This foreman cannot be blamed for not knowing, unless he had been taught about it. But if he had known, and had ordered the new thermometers on time, think what he could have saved his company! Both the foreman and his superintendent missed a big opportunity.

New Discoveries and Inventions

Brief reviews of new methods, processes, research and patents in the food industries

Too Much Steam in the Wrong Place

THIS case of spoilage, beets turning black in the can, was caused by understerilization. In other words there was not enough steam, or it was not used long enough, in the retorts. But, in order for the surviving bacteria to turn the beets black, it requires the presence of an abnormally high amount of iron in the contents of the cans. In this case the iron got into the cans by slopping of rusty hot water in the exhaust box. The open cans ride through hot water which reaches almost to their tops. Presumably too much steam was turned on, causing the water to boil so vigorously that it slopped into the open cans.

Another factor was the heavy contamination by a wholly new kind of bacteria which were not killed by the cook in the retort. They came from the hot water blancher in which the beats were scalded prior to slicing.

"The Cause of Black Beets," by Cameron, Esty and Williams, *Food Research*, 1, 74, 1936.

Hard or Soft Water No Effect on Dill Pickles

IN SPITE of the old belief that the quality of water has a lot to do with the way in which dill pickles ferment, there could be found no significant differences between hard and soft water. However, adding 2 lb. of sugar per barrel pepped up the beginning fermentation and was considered desirable. Adding vinegar was also helpful. Both aid in getting the right fermentation started.

But 2 lb. of prepared mustard per barrel did no good. Neither did washing the cucumbers with chlorine solution before fermenting.

"A Study of the Curing Process of Genuine Dill Pickles," By F. W. Fabian and L. J. Wickerham, Tech. Bulletin 146, Michigan Agricultural Experiment Station.

Vitamin C Disappears in Storage

VITAMIN C (ascorbic acid) in spinach varies 50 per cent in amount depending on the character of the soil in which it is grown. In the leaves the vitamin is thirteen to nineteen times greater than in the stems. But the Vitamin C disappears rather quickly in storage after harvesting unless it is kept cold. At room temperature half of it disappears in three days whereas, at temperatures slightly above freezing, about half the vitamin remains after seventeen days. (0.78 mg. per gm. to 0.39 mg. per gm.)

"Vitamin C Content of Vegetables. I. Spinach," by Tressler, Mack and King, *Food Research*, 1, 3, 1936.

Can Detect Oleomargarine in Ice Cream

ANYONE tempted to make ice cream from oleomargarine on the supposition that it cannot be detected after homogenizing should know that a new method of analysis has been invented. It will reveal the percentage of butterfat and oleomargarine.

See "Estimation of Olemargarine in Ice Cream," by T. H. Whitehead and J. B. Dunson, *Industrial and Engineering Chemistry, Analytical Edition*, 8, 203, 1936.

Preservation by Freezing

BACTERIA don't all die in frozen fruits and vegetables even after nine months at 0 deg. F. Enough of them are left alive to make the food spoil plenty fast after it has been defrosted.

"Studies in Numbers and Types of Microorganisms in Frozen Vegetables and Fruits," by A. G. Lockhead and A. H. Jones, *Food Research*, 1, 29, 1936.

New Way to Test Vacuum

TO FIND out how much vacuum is in an all-glass jar, take off the clamps, put it under water inside a vacuum desiccator (a strong glass receptacle). Pump out the air slowly until bubbles escape. Read the vacuum. Be sure that you don't get fooled by stuck sealing rings. Another way: weigh the jar, break the seal under water, remove the jar and dry it. Weigh again and compute the vacuum from the amount of water sucked in. Both methods come close.

"Vacuum Determination in All-Glass Canning Jars," by W. A. Maclinn and C. R. Fellers, *Food Research*, 1, 41, 1936.

Dry Butter Color

A RULING by the Food and Drug Administration may be necessary before the familiar colors for food fats can be used in dry form. Claim of adulteration by the powdered milk carrier may be the stumbling block.

Be that as it may, U. S. Patent No. 2,042,173 granted May 26 to Adino. F. Files, Maumee, Ohio, covers the use of from 10 to 50 parts of dry milk to 1 part of color as the means of getting the colors into a dry and easily introducible state. The preferred mixture is 24 parts whole milk powder to 1 part color consisting of 1 part A.B. and 9 parts O.B. Yellows certified for use in butter, oleomargarine, shortenings and similar food fats. Other proportions permit variation of intensity in color. Also according to the patent claims other coloring agents such as carrotin and extracts of annato and tumeric or mixtures of these agents may be substituted for the Yellow A.B. or O.B.

Wax-Sealed Foil Wrapper

USE of wax on paper as an adhesive as well as a moisture-resistant covering is not new. But as the means of binding a foil outer wrapper to the unwaxed-paper inner surface of a cylindrical package it becomes the subject of U. S. patent No. 2,043,829 issued June 9 and assigned to Beech-Nut Packing Co. by Donald R. Grant, Canajoharie, and Edward J. Hambrecht, Palatine Bridge, N. Y.

The manner in which the waxed-paper inter-liner is applied makes the idea patentable. U. S. Patent No. 2,043,830 covers the machine which feeds a strip of waxed paper and a strip of unwaxed paper about a cylindrical article at a slightly different rate of speed so that the end of the unwaxed paper extends slightly beyond that of the waxed paper. When the package is subsequently foil-wrapped heat is applied to make the wax on the waxed paper bind the wrappers together about the package. This method of wrapping is particularly applicable to fruit-flavored hard candy disks.

Safeguarding Nut Meats

IN U. S. patent No. 2,044,639 granted June 16 Julius L. Schneider, Chicago, Ill., recommends subjecting nut meats to high vacuum and impregnating them with an inert gas prior to packing in metal containers. Holding the vacuum three hours or more gets all the air out of the nut meats. Introduction of the inert gas into the chamber breaks the vacuum and fills the nuts. Immediate packing into cans washes out oxygen-containing air and gives nuts sealed in a protective atmosphere.

Patent is assigned to Continental Can Co., Inc.

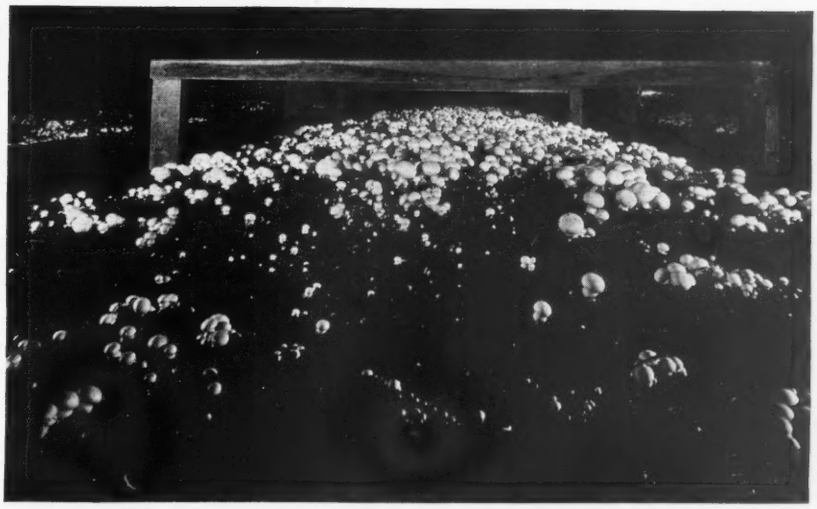
Molded Sausages

TO the consumer all skinless sausages may appear the same but not so to the sausage maker. U. S. patent No. 2,043,132 issued June 2 to Charles H.

Vogt, assigned to Modern Food Process Co., Philadelphia, Pa., describes a method of cooking them after molding so as to give uniform size and shape, a smooth and glossy finish, and a rigidity and dryness for individual wrapping in transparent cellulose.

By this method, sausages, formed according to U. S. Patent No. 1,964,011 granted June 26, 1934, are slipped back into the molds after smoking. Both ends of the molds are sealed with closure bars and rubber facings to make them waterproof. Then the sausage-filled molds are kept for about 10 min. in a vat of 170 deg. F. water to complete the cooking started in the smoke house. When removed from the molds the sausages are firm and dry ready for individual wrapping or packing unwrapped in a carton.

According to Patent No. 1,964,011 these sausages are formed by forcing the familiar sausage mixture into individual molds of desired shape and size, freezing it, and removing by pushing endwise from the molds without distortion. They are then exposed on screens to a moist atmosphere or vapor bath at 90 to 100 deg. F. followed by a dry air heating at 100 to 120 deg. F. This treatment forms a membrane on the exposed surfaces so that the sausages can be heated in the smoke house to a temperature of 165 deg. F. or higher without being ruptured or distorted in shape. In fact their condition is such that they slip snugly back into the molds for the subsequent cooking in the 170 deg. F. water bath.



Refrigeration permits the growth of mushrooms in summer. The first crop is kept at 70 deg. F. until it sprouts. Then the temperature is quickly dropped to 53 deg. F. and kept there until the crop is harvested. When the second crop sprouts the temperature is raised to 54 deg. F. and maintained there. For the third crop, a temperature of 55 deg. F. is maintained. The humidity is also controlled and must be kept below 80 per cent relative humidity. All drafts must also be avoided.

Something New Tea Seed Oil

TEA seed oil was practically an unknown commodity in the United States eighteen months ago. Suddenly it began to be imported at the rate of a million pounds a month.

Watchful Food and Drug Administration officials began to wonder to what purpose. They started to investigate. Obviously tea seed oil was not being sold as such.

Food Administration chemists began making tests. They developed some new tests for olive oil adulteration. Tea seed oil was getting on the market as "pure olive oil."

Ordinary chemical and physical tests did not show any difference in the properties of refined tea seed oil and olive oil. Flavor could not be the identifying factor when the oils were mixed because refined tea seed oil is a decidedly bland oil. It could not impart any strange flavor to the mixture. Color appeared normal for olive oil.

True, but a new test did tell the story. It showed that olive oil stocks were being adulterated from 25 to 80 per cent with refined tea seed oil. The mixtures were being sold as "pure olive oil."

Until very recently this test has been kept secret by the federal officials because of its value to them in identifying concerns doing this large scale adulteration of olive oil. At present writing one of these concerns has lost a court suit. Others are facing suits and the payment of penalties for cutting their olive oil stocks with tea seed oil.

The details of the test were worked out by Jacob Fitelson, Chief Analyst, Food Laboratory, Food and Drug Administration, U. S. Department of Agriculture, New York City. It is worth money to users or packers of olive oil. Now, they can determine whether the pure olive oil they are buying is as represented or whether it has been cut with refined tea seed oil and, if so, how much.

The basis of the test is a color change which is fugitive. It holds only for several minutes. Details of the test must be followed exactly to get conclusive results. They are as follows:

Measure into a test tube (18x150 m.m.) exactly 0.8 c.c acetic anhydride, 1.5 c.c. chloroform and 0.2 c.c. conc. sulphuric acid. Mix and cool in a water bath at 25 deg. C. When cool, add 7 drops of the oil to be tested (regular size glass tubing 4 m.m. outside diameter and about 2 m.m. inside diameter is used). These 7 drops should weight about 0.22 gram. (By actual test there is a variation of from 0.215 to 0.230 grams.) Mix and cool again at 25 deg. C.

If the solution of oil in the reagent is cloudy, add acetic anhydride drop by drop. Shake after each drop. Add until a clear solution is suddenly formed. (Slight deviation from standard concentrations, particularly in the sulphuric acid, causes variations in color intensity). Allow test tube and contents to remain at 25 deg. C. for five minutes. Then add 10 c.c. precooled anhydrous ethyl ether from a graduated cylinder and mix immediately by inverting.

Tea seed oil shows a brown color changing to an intense red within a minute or so. This red color reaches a maximum and then fades within a period of a few minutes.

Pure olive oil forms an initial green color fading to a brownish gray, occasionally passing through a faint pink stage.

Mixtures of olive oil and tea seed oil will show a transient red color which is proportional in intensity to the amount of tea seed oil present.

Standards containing known amounts of refined tea seed oil and olive oil may be run simultaneously with the test sample. The proportion of tea seed oil present can be estimated directly by comparison with the standards. About ten minutes are required for the test.

When checking the test sample against control mixtures of tea seed oil and olive oil the test tubes and contents should be held in ice water. Also the anhydrous ethyl ether should be precooled to the temperature of ice water. If these details are observed the colors in both control and test samples will develop slowly and reach a maximum in about five minutes. Then the colors will remain fairly constant from five to ten minutes before beginning to fade.

In both the qualitative and quantitative parts of this test only fresh reagents can be used. They must be made up as used. Otherwise the test results will not be reliable. Traces of water in the ether will interfere with the color development even to the point of preventing any color forming.

This test was recently revealed in a suit against Cosmos Food, Inc., Lynn, Mass. A jury verdict for the Government has just been rendered (June 23), in the Federal Court at Concord, N. H. Food and Drug Administration officials had made four seizures of oil which was being sold as olive oil. According to the new test this "olive oil" was largely refined tea seed oil. The jury decision establishes the correctness of the test for legal purposes.

Answers To Plant Questions

★

What is your experience in combating molding in the basement where raw food and supply materials are stored?

Does Not Use Basement Storage

I AM HAPPY to say that I shall be unable to give you much information on our experience in combating molding in basement storage. We have not had any such difficulty and for that reason have no experience in combating it. This condition is undoubtedly due, at least in part, to the fact we do not use basement storage for raw food materials.

I believe that a dry and fairly cool room is the only suitable place for storing most raw materials used for the production of the type of products we manufacture. — A. G. OLSEN, *Walter Baker & Co., Inc., Dorchester, Mass.*

Has a Good Basement

WHEN our plant was constructed, special care was taken to build a dry basement.

In addition, any goods which may have a tendency to become moldy are always stored on platforms about 4 in. high.—A. J. STALTER, *Paul F. Beich Co., Chicago, Ill.*

Has Dry Storage Room

WE HAVE NOT HAD a great deal of experience in combating molding in basement storage of raw materials as we are very fortunate in having a reasonably dry storage room in our basement.

However, if we should run into this difficulty, we would do one of two things: (1) We would try the use of calcium chloride; either the powdered or lump form. It should be put in a metal container with a perforated bottom to permit drainage. An ordinary metal pail is the most acceptable form of container.

One or several of these containers, depending upon the size of storage space to be dried out, can be placed around the room. As you may know calcium chloride has a particular affinity for the moisture in air which results in the moisture present being drawn to and deposited upon it. This procedure works out very well. If used in an air-tight room, it has the additional property of reducing the temperature to a slight extent, and, in that way acts as a refrigerant.

2. To purify the air, we might operate an ozone machine. — BRONSON PALMER, *Palmer Candy Co., Sioux City, Iowa.*

Relies Upon Good Storage Practice

PREVENTION of mold in raw material storage rooms at the Schrafft factory in Boston is not a troublesome problem. The factory has no basement. The first floor, where raw materials are stored, is 3 ft. above ground level and all storage rooms are either well ventilated or refrigerated.

In many cases raw material stocks are piled on skids or portable platforms with aisles between the goods so that inspection and the removal of leaking barrels or defective containers are easily accomplished. No moisture, dirt, or litter is allowed to accumulate.

Our experience indicates that absence of dampness and observance of good storage practice are all that is necessary for the elimination of mold. —R. I. CARNEY, *W. F. Schrafft & Sons Corp., Boston, Mass.*

Avoids Dampness

WE WOULD NOT advise the storing of raw materials in a basement where there is the least bit of dampness. I find from my experience of 30 years that most raw materials used in the manufacture of candy should, by all means, be kept in a very dry place. Chocolate and cocoanut will mold very quickly if exposed to dampness in a basement.

Candy which is made up for stock should not be stored in a basement unless the basement is fully dry and contains no foul air.

Basements for stock should be insulated with 4 to 6 in. of cork.—R. E. TORRENCE, *Harris, Woodson Co., Inc., Lynchburg, Va.*

High Humidity Aids Mold Growth

IT SO HAPPENS we do not store materials in basements. In fact a large majority of our buildings are constructed without basements.

I am able to remember only one instance where we were confronted with mold development. This was in a small room in which the humidity was relatively high. — S. F. HINKLE, *Hershey Chocolate Corp., Hershey, Pa.*

Uses Specially Built Storage Vault

WE HAVE constructed a concrete vault located in the basement of our mill for the storage and proper keeping of supplies. This vault is finished in concrete, painted white, with steel racks. We have automatic humidity and temperature control, as well as ventilation. There are no windows in the vault, but the door is covered with a fine mesh screen to permit circulation through the room and prevent vermin from entering. This room is periodically sprayed with a dilute solution of sodium hypochlorite to prevent the accumulation of mold.

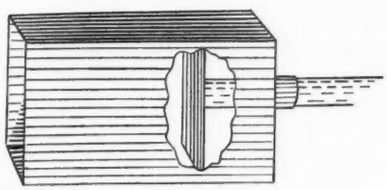
We have found that by following the above precautions, we have had no damage to bags and no development of mold in the cereals. Incidentally, we find that one of the most important matters to consider in the storage of paper bags is humidity control, in order to prevent a large percentage of breakage when the bags are used, due to dryness of the paper.—L. H. PATTEN, *State Mill & Elevator, Grand Forks, N. D.*

Next Question

What conditions of storage for raw foods and supply materials do you recommend for the avoidance of molding?

The PLANT NOTEBOOK

Five dollars will be paid for brief stories which are suitable for use in this department. Sketches or photos should be provided whenever possible.



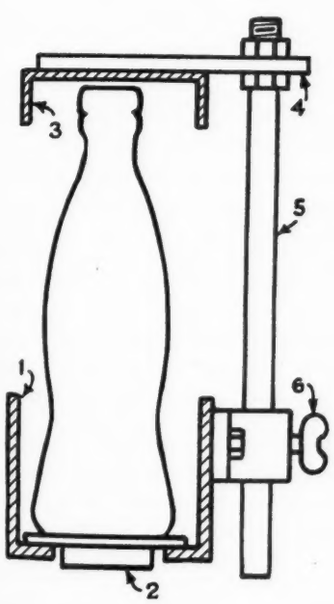
Mold for sausage packing.

Packing Device

IN EXPERIMENTING with a transparent cellulose wrapper for its pork sausage, the Atlanta, Ga., branch of George A. Hormel Co. discovered that the material would not hold a crease or fold properly around the damp sausage. Much rewrapping, loss of time and reduced production resulted.

The difficulty was, however, quickly overcome when plant superintendent B. E. Hibbert and departmental assistant C. O. Hindsdale designed a small mold after the fashion of the accompanying sketch. The sausage is packed in this by hand, the cellulose wrapper is folded over the mold and sealed at one end. Then the sausage is pushed out of the mold by means of the plunger and handle shown in the sketch. This pushes the sausage against the sealed end of the wrapper, and the wrapper, with the sausage in it, is pushed off the mold. The package is then closed on the unsealed end.

The mold which does the trick is simply a small metal box, made of galvanized steel sheet. It is 4x7x1½ in. The joints are welded. The plunger is a flat plate of the same metal, with a handle extending through a collared hole in one end of the mold. —J. P. PETIT, *Atlanta, Ga.*



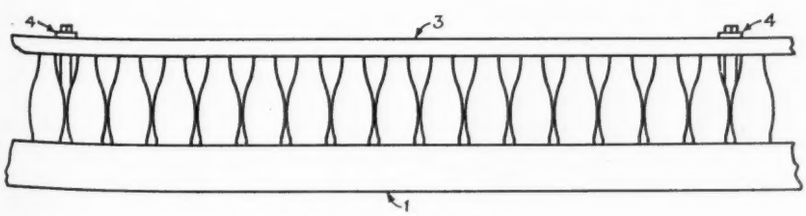
Bottle Conveyor Cover

TO PROTECT bottles on the conveyor line as they pass from the washing machine to the filling machine, the arrangement shown in the accompanying sketch has been developed.

In all bottling plants there is a length of conveyor over which the bottles must travel as they move between these two machines. During this time, the newly-cleaned bottles are exposed to anything that could get into them, such as flies, dirt, dust and other foreign matter.

The cover here sketched forms a very effective means of preventing this. It is quickly adjustable to different heights of bottles. Any bottle can be removed by tilting it either forward or backward and taking it out between the side of the conveyor and the cover. It is also easy to keep clean.

In the sketch the numbers refer to the following parts: (1) Sides of conveyor line. (2) Track on which bottles move. (3) Cover to protect clean bottles from the entrance of foreign matter. (4) Bracket riveted to top of cover to secure it to 5. (5) Cover supporting rod (adjustable). (6) Wing nut to lock rod 5 in place after adjustment has been made.



Bottle conveyor cover.

Protecting Concrete Outdoors

CONCRETE and masonry walls, exposed to the weather, must be watched and protected from year to year or they will be seriously damaged. The winter months are particularly hard on this outside masonry. For that reason, the spring or summer months should be used for giving them a good coating of protective paint.

Special paints are available for protecting such surfaces both within and without the plant. For inside floors it is a good thing to use a special cement floor enamel, which is quick to dry and forms a coating that is not affected by oil or water. On the outside, however, it is better to use a cement-base paint that will keep water out of any cracks that may have formed.

The importance of keeping water out of hairline cracks is not often appreciated. Consider what happens to such cracks, which may be easily formed by slight settling of the build-

ing or even by sudden changes in temperature or humidity.

A beating rainstorm will cause a certain amount of water to find its way into such a crack. Even when the storm don't beat, some water will get in. After the rain, freezing weather follows. This freezes the water, and water expands when it freezes. In that hairline crack, this frozen water becomes a powerful lever as it freezes, spreading the crack slightly. The next time a beating rain comes, followed by a freezing spell, the process is repeated. But this time more water has been taken in and the freezing leverage is greater. The thing works like compound interest. Such cracks, therefore, if neglected, are sure to grow and to grow with increasing speed.

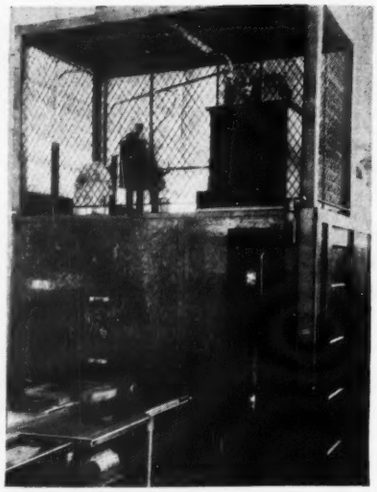
Cement-base paints, which will keep water out of these hairline cracks when they are first formed, is therefore the best kind of insurance. Its use for protecting outside concrete walls is one case where preventive maintenance is outstandingly superior to any cure.—J. E. HYLER, *Peoria, Ill.*

Using X-Rays

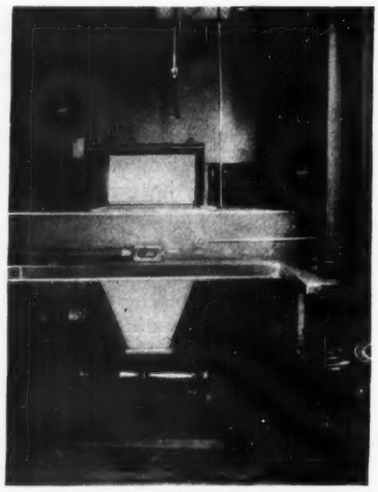
FOR ABOUT two years we have made X-ray, or fluoroscopic, examination of packages for the purpose of detecting and removing foreign materials from our product. This is desirable, not because of any definite tendency of the product to contain foreign matter, but simply as an added safeguard against even one piece of such material reaching a customer. In our plant, the greatest care is used and the best known devices are employed to detect and remove foreign matter from our raw materials and our goods in process. The product is then as near 100 per cent clear as possible. But if one contaminated piece does pass this careful inspection, it is expected that the X-ray operator will find it and remove it.

While the money value of this practice cannot be estimated, we believe it to be very desirable if it prevents the one bad piece in several million from getting out of our plant. We have found that the X-ray method is practical, having passed the experimental stage.

The X-ray apparatus used is of the same type and size that is used for medical purposes. The water-cooled X-ray tube is self-rectifying and is operated at 25 to 80 kv. and 4 to 12 ma., according to the illumination and penetration needed. Control is through step-up transformer and filament transformer and resistance controls, volt-meter milliammeter and switches. The primary current is 230 volts, 60 cycles. Lead glass and fluoroscopic screen are each 12x16 in.



Packages entering the X-ray booth for examination, showing part of X-ray apparatus at top of booth.



Front lead cover of X-ray inspection booth removed, showing X-ray tube, lead cone, top of tunnel, observation mirror, and mechanical levers for rejecting packages containing contaminated pieces.

The tube is mounted underneath a canvas conveyor belt. It is arranged so that the radiation is directed upward through one layer of the belt, the package that is being examined, the fluoroscopic screen and the lead glass, all of these being in horizontal position. The shadows are observed in a mirror, set directly back of the screen and at an angle of 45 deg. to the screen. In this way, observation is made only indirectly.

The whole radiating apparatus is screened by $\frac{1}{16}$ in. of lead, the 12x16-in. screen set into the top of the tunnel over the conveyor belt being the only opening.

As the packages are conveyed by the belt over the X-ray tube, their position is a few inches lower than the fluoroscopic screen. This makes shadows on the screen move faster than do the belt and packages. The shadow movement is also faster for pieces on the bottom layer in the package than for pieces in the upper layers. By experience with this motion, the operator can usually tell in which layer any foreign particle may be.

The cost of this method of examination is relatively small, the operator's time being the one large item. Other items of expense are small, particularly when the number of pieces being examined is large. The apparatus cost about $2,500 installed. Tube replacement cost is adjusted on the basis of 1,000-hour tube life. The number of pieces examined varies from 8,000 to 20,000 per eight-hour day.—L. P. LEATHER, *Boston, Mass.*

Cleaning Trolleys

KEEPING conveyor trolleys clean and free from rust has always been a problem, particularly in packing plants where the trolleys are exposed to the corrosive effect of brine-spray coolers. To clean these trolleys with a brush and "elbow grease" involves a great amount of labor, and the results are not as good as they should be. Various other methods have been employed, one of which uses a mechanical tumbler and timothy hay for polishing the trolleys. A simple and economical method, that has given good results during a year of operation, is used in the plant of Merkel, Inc., Jamaica, N. Y.

This method cleans the trolleys in a 150-gal. bath of mineral oil which is kept at a temperature of 195 deg. F. A machine made by Allbright-Nell Co. is used. It consists of a steam-heated oil tank and a square, perforated steel cage or basket which rotates at 75 r.p.m. on a horizontal axis, dipping into the oil. Each of the four sides of the cage opens on hinges to give

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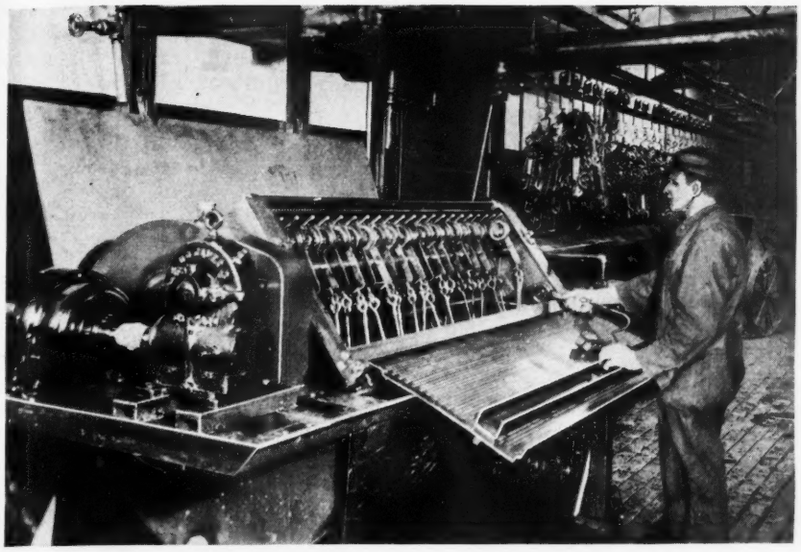


Machine for cleaning conveyor trolleys.

access to a row of 21 iron pegs, on which the trolleys are hung. With 84 trolleys in place, the cage is revolved for ten or fifteen minutes, depending upon the condition of the iron. This dips each trolley into the hot oil from 750 to 1,125 times, and also splashes the hot oil over it. The treatment cleans the iron and also coats it with oil for protection during subsequent use.

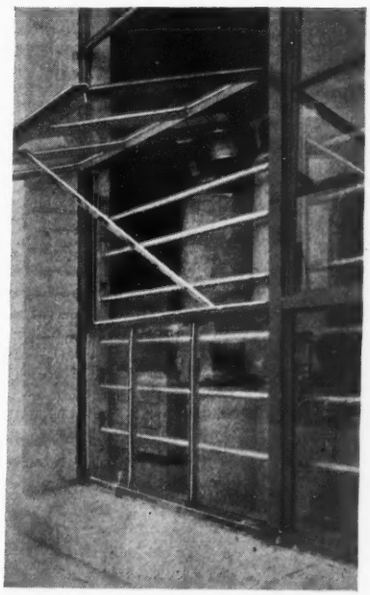
The trolleys are brought to the machine by overhead rail, being hung in bunches from other trolleys. They leave by the same route, but are allowed to hang over a galvanized iron drip pan long enough for surplus oil to drain off. This drip pan returns the recovered oil into the oil tank and also serves to keep oil off the floors.

The pan, which is about 18 in. wide and 20 ft. long, is shaped like a curved trough and is inclined slightly to permit drainage.

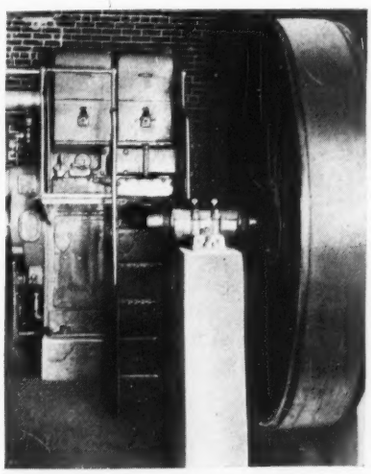
After two days of operation, the oil becomes too dirty for further use. It is then reclaimed by passing it through a cloth and water filter to remove the sediment. Make-up oil is added in the proportion of about 25 per cent over a period of two months.

The cost of this method has not proved to be great. The power required is that taken by the 3-hp. motor which rotates the cage. Also, some steam is consumed in heating the oil. The oil itself is an inexpensive grade. The labor of one man is sufficient to load, unload and operate the machine.

Before this plant adopted this method of cleaning trolleys, it used the brush method. Then, the cleaned iron had a reddish appearance. Now, the metal is bright and shiny.



Guard to prevent window breakage.



Natural gas engine used for power production in a flour mill.

Window Guard

WINDOW breakage in our plant was caused at times by bottle cases and cans. These are stacked near the windows in position convenient to the washers. Sometimes the stacks tumbled down, and fell against the windows.

To guard against this loss, we installed demountable guard bars made from ½-in. pipe. These bars rest in sockets made out of 1x2 in. channel iron. As can be seen in the accompanying photograph, lengths of this channel iron are bolted to the window frame, lip side down. In the channel shown, rectangular holes, larger than the bars, have been cut to receive the bars. The holes cut in the channel on the opposite window frame (not shown) are round with a diameter just large enough to receive the end of the bar. Arranging the holes in this way makes the bars easily demountable.

Supports at the mid-section of the window are made of plain strap iron, bolted in place. As can be seen in the photograph, the ventilating section of the window operates as well as before. Practically the same amount of light also finds its way into the washer room.—BILLIE BURGAN, *San Diego, Calif.*

Saving With Gas Power

FROM wood to coal to natural gas is the order of fuel changes made by Farmington Milling Co., Farmington, Mo., in arriving at their cheapest source of power. This mill found itself at a disadvantage when competing with other mills as it had a high power cost. The coal-fired steam plant which was being used supplied power through a Corliss type engine. Some of the mills' competitors were using oil or gas for fuel and were getting their power at much less expense.

Recently this mill installed an internal combustion engine of Bessemer-Cooper type, using natural gas for fuel. This gas is available at the plant at 32 cents per thousand cu.ft. At this rate, the mill finds that their power cost per barrel of flour produced is about one-third of what it was with the steam engine.

The new engine is of the two-cylinder, four-cycle, vertical type. It drives the mill machinery through a lineshaft by means of a short-center belt drive. It supplies power for all the needs of the company in the manufacture of flour, meal and feed.

NEW EQUIPMENT
for Food Manufacturers

Portable Sifter

ALONG the lines of their 3 in 1 aerating sifter, Read Machinery Co., Inc., York, Pa., has developed a portable aerating sifter, known as the "Floor" or "3-legged" type. Through the use of the three-tray sifting action, this device aerates the flour at the same time as it sifts, thus increasing the volume from 10 to 30 per cent. The device is also said to assure greater fineness of flour, resulting in increased absorption and consequently improving the dough by a more uniform mix, better flavor, and better texture. The three legs allow it to set solid and level on uneven floors.

Geared Motors

TO MEET various speed requirements, Wagner Electric Corp., St. Louis, Mo., has developed fractional horsepower, geared motors suitable for direct connection to agitators, conveyors, low-speed pumps, mixers and similar equipment. These motors are available in single and double reduction types with right-angle shaft drives, and in single, double and triple reduction types with parallel shaft drives. Speeds as low as 6 r.p.m. are available.

Steam and Condensate Return

EQUIPMENT for returning steam and condensate to the boiler at high temperatures has been developed by the American District Steam Co., North Tonawanda, N. Y. This equipment is handled by the Becker Pump Co., Oakland, Calif., in the western territory. It is motor-driven, having one moving part. It is designed for operation at temperatures ranging from 275 to 350 deg. F., depending upon conditions.

Feeder and Drive

A VARIABLE SPEED, positive paddle type feeder for handling finely powdered products has been developed by Sprout, Waldron & Co., Inc., Muncy, Pa. The feeder is made of corrosion resisting materials, principally of cast aluminum. Its paddles may be varied in speed from 2 to 20 r.p.m. through the use of a New Departure Transitorq unit driving through a 20:1 double reduction speed reducing unit. The feeder is driven by a ½ hp. explosion-proof motor.

As can be seen from the accompanying photograph the entire driving mechanism is mounted on a single base, while the feeder unit is designed for fitting directly into a 12-in. pipeline. The capacity of this feeder for each revolution is 121 cu.in.

Traffic-Type Trucks

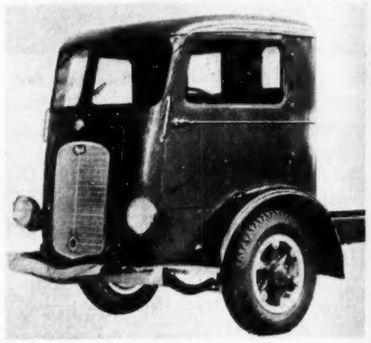
MACK TRUCKS, INC., 25 Broadway, New York, N. Y., have added two lighter models to their line of traffic-trucks. Known as the Model EC and EB these trucks correspond respectively to the conventional Mack Models BG and BF. The purpose of the new designs is to shorten the forward construction and thus provide better weight distribution and a saving in length of the truck. The new models are each 3 ft. shorter than the corresponding conventional models. The accompanying photograph indicates how this has been accomplished.

Can Filling Machine

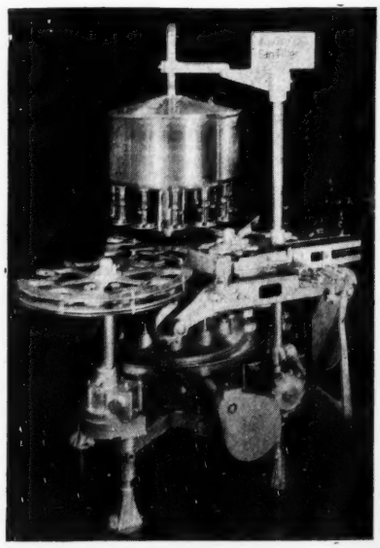
DESIGNED to operate at 120 cans per minute on the average product Horix Manufacturing Co., Corliss Station, Pittsburgh, Pa., has brought out their new Model H-S, 12-tube can filling machine. This new machine is an addition to their line already containing an 18-tube machine and is in general similar in design. It can be furnished with all parts coming in contact with the product made of bronze, nickel or stainless steel, whichever is necessary to meet the requirements of the operation.

Remote Valve Control

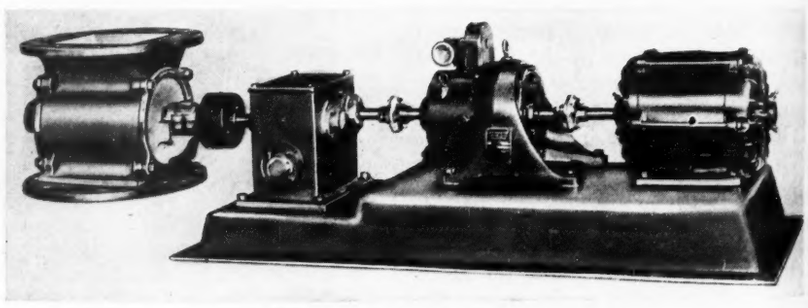
A HAND-OPERATED remote valve control for use with automatic control systems has been developed by the Foxboro Co., Foxboro, Mass. This control is adapted for mounting on a centrally-located instrument panel and permits the operator to adjust manually the degree of opening in any valve in the system, no matter how inaccessible it may be. By its use it is possible to reset any of the valves to control temperature, pressure, flow, or liquid level, using the readings on the recording instruments on the panel as a guide for correct adjustment. The manufacturers claim that with this control the valve openings can be al-



New traffic-type trucks.

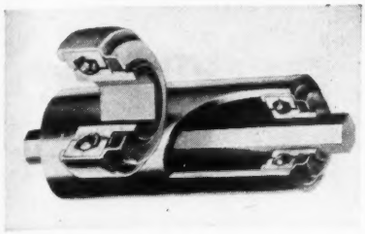


Can filling machine.

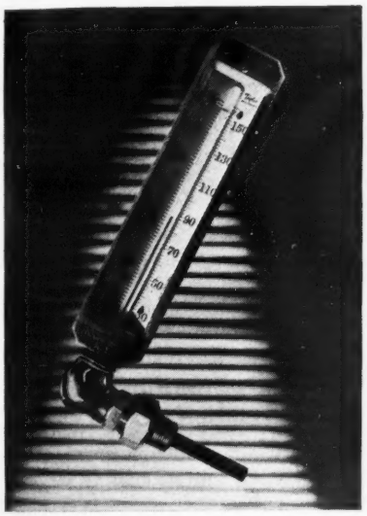


Variable speed feeder and drive.

tered by as little as a few thousandths of an inch and that when it is used in conjunction with their "Stabilflo" valve, the controlled flow can be changed by less than 1 per cent.



Hexagon shaft for conveyor rollers.



Easy reading thermometer with Binoc tube.

Conveyor Rollers

ROLLERS for roller conveyors incorporating hexagonal shaped axles have been added by Mathews Conveyor Co., Ellwood City, Pa., to their line of "knurled-keylock" roller conveyors. The new rollers are available in practically all sizes and types. The object of this development is to accomplish the locking of the inner ball race of the bearing to the axle.

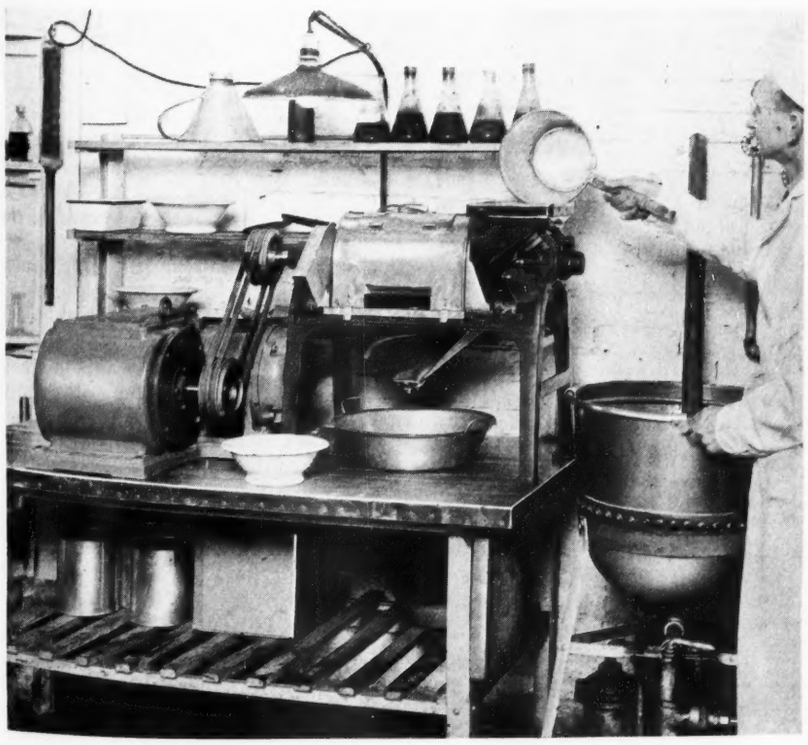
Easy Reading Thermometer

ALL thermometers for the food industries made by Taylor Instrument Co., Rochester, N. Y., are now equipped with the "Binoc" thermometer tube. This development has been made for the purpose of increasing the readability of these instruments.

Advantages claimed for the new tube are as follows: More than twice the accustomed angle of vision combined with high magnification of the mercury column; binocular vision, that is, readability with both eyes, at normal and greater than normal distances; triple lens construction which gathers three times as much light and concentrates it behind the mercury column, making the column stand out in flat relief; elimination of empty-bore reflection and consequent confusion of reading.

Laboratory Pulper

THIS device is a duplicate of the standard, large-sized pulpers made by this company and is designed for use with any of the products with which a pulper is normally used. It is operated by a 1-hp. motor which is equipped with a Reeves variable speed drive, giving a range of any speed between 950 and 1,900 r.p.m.



Laboratory pulper.

Bar Wrapping Machine

PACKAGE MACHINERY Co., Springfield, Mass., has brought out an improved Model GH bar wrapping machine. This machine will handle bars up to 10 in. in length and can be furnished with additional parts, enabling it to wrap more than one size. It uses flat or turned up side trays and printed, transparent wrapping material in roll form. The registering of the printing on the bar is controlled by photoelectric cells. Printed foil may be used and its positioning is controlled in the same way. In addition, an inner liner may be used as well as the outer wrapper, the cutoff of both sheets being the same.

If printed paper wrappers are used, the machine is built with a sheet feed. The design of this wrapping machine is such that it can accommodate irregularly-shaped as well as regular bars.

Variable Speed Drive

A VARIABLE SPEED DRIVE which combines in a compact enclosure any standard make of constant speed motor, a variable speed control mechanism, and where required, speed reducing gears, has been developed by the Reeves Pulley Co., Columbus, Ind., under the name of the "Vari-Speed Motodrive." It is available in either horizontal or vertical designs and in each of these designs is supplied to take different sizes of motors from $\frac{1}{4}$ to $7\frac{1}{2}$ hp. In different combinations of sizes, ratios and reduction gears, output speeds ranging from 1.35 r.p.m. to a maximum of 3,480 r.p.m. may be obtained. Within the upper and lower limits of any given combination, the Reeves variable speed drive permits the attainment of any speed desired.

Dust Collector

A NEW dust collector, called the "Dustube," has been developed by American Foundry Equipment Co., Mishawaka, Ind. Tubes are of special-woven fabric, suitable for filtering the kind of dust that is to be handled. They are hung from racks on the ceiling. Self-acting dust seals hold the tubes to the bottom, without clamps or bands. The seal is said to be positive in operation, with no leakage of dust. Spring suspension of the tubes maintains the proper tension of the cloth. There is a large air chamber, and the tube inlets are of open design, permitting operation at low suction pressure. This collector is recommended by the manufacturer for improving working conditions and eliminating explosion hazards.

The Manufacturers Offer

Food Plant Equipment

1. Air Conditioning Equipment — Buffalo Forge Co. Bulletin 501 discusses and gives data for Type "PC" cabinets for air conditioning.

2. Food Plant Equipment — United States Steel Corp. A bulletin entitled "Food Handling Advances" discusses and illustrates the applications of stainless steel of the 18-8 variety and the fabrication of various types of food handling equipment.

3. Handling Equipment — Barrett-Cravens Co. Bulletin 130 entitled "Pallet Handling Equipment" describes lift trucks, portable elevators, portable cranes, and accessories used in this system of factory handling.

4. Induction Motors — The Lincoln Electric Co. A new folder entitled "Facts for Users of A.C. Motors" gives prices and other data on squirrel-cage induction motors for general purposes.

5. Materials Handling — Lewis Shepard Co. Six circulars illustrate the handling of foods, as follows: No. 120, handling equipment for grocery warehouses; No. 119, handling beverages in cases and cartons; No. 121, handling bags of sugar, flour, beans, coffee and similar material; No. 106, handling fruit and produce; No. 318, handling bulk foods or containers.

6. Portable Sifter—Read Machinery Co., Inc. A folder describes and pictures this company's line of aerating portable sifters of the three-legged and pedestal type.

7. Pumps — Morris Machine Works. Bulletin 160 describes high speed, nonclogging centrifugal pumps for sewage and industrial services, in heads from 20 to 100 ft. and capacities from 150 to 7,000 gal. per min.

8. Pumps—Worthington Pump & Machinery Corp. Two new pump bulletins as follows: W-111-D9, describing Type AA horizontal single piston pumps, valve plate type, for general service in pressures up to 75 lb.; W-111-D8, describes horizontal single piston pumps, valve plate type, for general service in pressures up to 250 lb., Type AC.

9. Refrigeration—General Refrigeration Sales Co. A loose-leaf illustrated catalog shows many of the recent installations of Lipman automatic refrigeration made by this company.

10. Water Heaters—American District Steam Co. Bulletin 35-76 illustrates and describes copper U-tube water heaters of the instantaneous or gravity recirculating types for heating or cooling water, oil and other liquids.

Packaging

11. Closures—Crown Cork & Seal Co. A booklet entitled "Baltimore" gives both a brief discussion of the history and developments of Baltimore and of the development and operation of the Crown Cork & Seal Co.

12. Labels—Schmidt Lithograph Co. A loose-leaf catalog illustrating and describing some of the labels made by this concern for the industry.

Plant Supplies and Accessories

13. Factory Doors—Bethlehem Steel Co. Folder 373 describes the "Bur-Vett" vertical lift steel door for factory use.

14. Factory Grilles — Cornell Iron Works, Inc. An 8-page illustrated bulletin describes and specifies rolling grilles for closing openings in factories and other buildings.

15. Fans — Propellair, Inc. A new folder giving specifications and illustrations of circulating fans made by this company.

16. Lubrication — Alemite Division, Stewart-Warner Corporation. "The Case of Alemite vs. Friction" is a 32-page catalog giving information and prices of all Alemite equipment used for industrial lubrication.

17. Steam Engines—Troy Engine & Machine Co. Bulletin No. 305 is a 38-page catalog of Troy Engberg vertical and horizontal steam engines of generating sets.

18. Valves — The Lunkenheimer Co. Catalog No. 541-A describes plug type, Ferrenewo and Renewo valves for use where there is severe wear on the valve parts such as in heavy throttling service.

19. Ventilating Equipment — Ilg Electric Ventilating Co. Catalog No. C-51 is a condensed catalog of ventilating, heating, cooling and air-conditioning equipment made by this company.

Control Equipment

20. Control Instruments — Brown Instrument Co. A booklet entitled "Instruments from the Executive's Viewpoint" discusses the various types of control instruments made by this company and their application in industrial plants.

21. Electric Control — Leeds & Northrup Co. Catalog N-OOA discusses Micromax electric control for proportioning input to demand.

Laboratory Equipment

22. Laboratory Apparatus—Pfaltz & Bauer, Inc. New leaflet describing the following equipment: Photoelectric reflection meter for flour testing. Ocular photocells of the Lange type; Photoelectric colorimeters of the Universal model.

23. Laboratory Glassware—Kimble Glass Co. A new 60-page illustrated price list of various types of laboratory glass made by this concern.

24. Optical Instruments—Bausch & Lomb Optical Co. Catalog D-20 is a 32-page illustrated catalog of instruments used for spectrographic analysis.

Chemical Materials

25. Bottle Washing — Philadelphia Quartz Co. A folder gives a formula (using Metso) for a bottle washing solution for bottlers of carbonated beverages, with instructions for use.

G. L. Montgomery,
Managing Editor, Food Industries,
330 W. 42d St., New York, N. Y.

July, 1936

TO THE READER: Use this convenient form to get the bulletins you need.

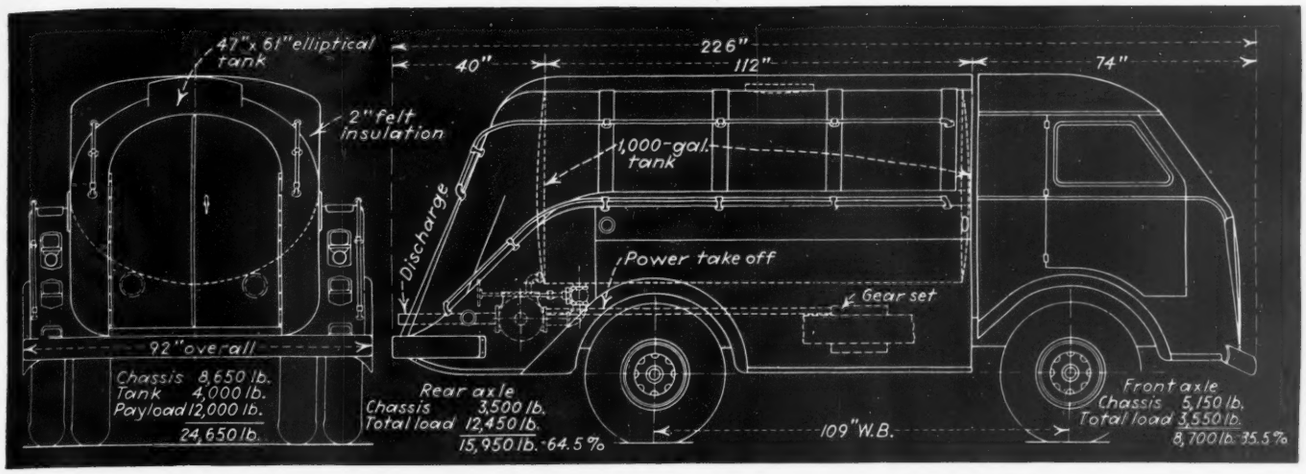
Please send me the bulletins indicated by the following numbers:_____

_____

_____

Employer_____ **Your Name**_____

Position_____ **Your Address**_____



Rear and side of a new Corn Products Sales Co. truck tanker mounted on a short wheelbase Model UD Autocar, showing the Heil aluminum tank and streamlined outer shell. Note also the Foster gear-type pump mounted at the rear bottom of the tank and capable of delivering the syrup to a height of eight stories. The tank has a capacity of 1,000 gal. weighing 12,000 lb. Below is a front view of one of the tankers used in Philadelphia, showing particularly the Autocar standard streamlined cab, the streamlined tank covering, and the side lettering. The cab and body are painted white.

Streamlined Tank Truck

A STREAMLINED outer shell and a heat-jacketed delivery pump feature a new type of tank truck used by the Corn Products Sales Company at its plants throughout the United States. The vehicles, shown in the photographs and drawings on these pages, deliver corn syrup from the company's various refineries to customers in the confectionery trade.

While this truck is used by the owners for delivery of corn syrups, its design is one that should prove useful for the handling of many other food products such as sugar syrups, molasses, and vegetable oils.

For easy handling at the customer's points of unloading and for a better weight distribution between front and rear axles, each of the new units, is mounted on a Model UD Autocar chassis with a wheelbase of 109 in. In keeping with the streamlining of the outer shell, a standard Autocar streamlined cab is employed to give an exceptionally well-proportioned vehicle. Painted white, it attracts attention wherever seen and has considerable advertising value. The choice of white as a vehicle paint color is in keeping with the trend to use light colors on trucks handling products in the food industries.

The tank and outer shell, built by the Heil Company, Milwaukee, Wis., were designed jointly by George Kuhlman of the latter company and R. R. Seburry of the Automobile Department of the Corn Products Sales Company at New York City. Features of the streamlined shell include an enclosure over the filling manhole at the top of the tank; an inclined rear enclosure with doors and catwalks on each side for the convenience of the man filling the tank by gravity from overhead tanks at the company's refinery.

It is to be noted that the manhole enclosure extends for the full length of the shell and that its top line is level with the top of the truck cab to give the effect of greater length. Countersunk steps are provided at the rear inclined section of the cat-walks to enable the tank filler to reach the horizontal portions without marring

the shell paint. Hand rails are provided as shown in the accompanying views for the same purpose. Electric side and rear marker lights are recessed in the shell to prevent breakage.

The tank proper, which is elliptical with convex ends as shown in the drawing, is made of aluminum and holds 1,000 gal. of syrup. The latter weighs 12 lb. to the gallon, so that the payload carried is 12,000 lb. The tank is 112 in. long and is mounted on five steel cradles. All fittings, piping, etc., are of aluminum, bronze or brass.

Because of the extremely heavy viscosity of the syrup when cold, it is loaded into the truck tank at a temperature of 100 deg. F. So that the syrup does not cool off from the time it is loaded into the tank until delivered into the holding tanks of the confectioners, the truck tank must be insulated. This is done with a layer of asbestos paper; 2 in. of felt; another layer of asbestos paper; a canvas jacket; a layer of brown paper and finally the outer steel shell. This insulation maintains the syrup temperature without loss, even on the coldest days and the longest hauls.

THE maintenance of the syrup temperature at 100 deg. F. and the consequent fluidity at that temperature is of the greatest importance, especially when the syrup has to be delivered into reservoir tanks at a higher level than that of the truck tank itself.

The method of discharge of the Corn Products tankers shown herewith is new in that instead of using compressed air furnished by an air pump driven off the truck engine, to force the syrup to whatever level above the tank is required, a heat-jacketed Foster gear-type pump is employed. As shown in the line drawing, this pump is located at the rear of the tank and in back of the truck's rear axle. The pump inlet is at the bottom of the tank so that its feed is by gravity. The pump is driven by a power take-off from the truck gearset mounted amidships.

Exhaust gas from the truck's engine is passed around the pump within a surrounding metal jacket so that the temperature of the syrup is not lowered at the pump. The pump is provided with a bypass by means of which the syrup may be pumped back into the truck tank while connections in the building discharge lines are being made or changed. The pump develops a pressure in the discharge line of 125 lb. per sq.in., so that the syrup may be pumped to a height of eight stories above the street level. The connection from the truck pump to the building line is made through opening the two rear doors of the outer shell around the tank proper. The actual connection is made by two lengths of 4-in. high pressure hose. When not in use, these hoses are carried out of sight in two 7-in. metal tubes extending the full length of the tank below the tank but inside the outer shell.

The heat-jacketed pump is more positive than the former pressure method using compressed air, is of greater capacity, and makes possible the use of a lighter tank.

Rear view of one of the Philadelphia tankers showing the general body and cab outline and the side and rear lettering employed. Note also the side and rear marker lights and the recessed cat-walk steps.

Practical Problems of
TRUCK TRANSPORTATION

DISCUSSED BY EXECUTIVES IN THE FOOD INDUSTRIES

Requirements of Truck Brakes; Methods of Testing

Question No. 18

From a safety standpoint, do you believe that:

1. All trucks, regardless of gross weight, should be capable of stopping in the same distance when traveling at the same speed?

2. If so, what distance should this be when traveling at 20 miles an hour?

3. In testing your truck brakes, how is this distance measured?

4. Can it be measured in any other way than by a deceleration meter?

5. Is it possible to obtain equal stopping distances with service and emergency brakes?

6. If not, do you believe that truck manufacturers should provide emergency brakes at equal capacity to service brakes?

Experts Should Test Brakes

IN regard to the six questions pertaining to brakes:

1. Yes, all trucks regardless of gross weight should be capable of stopping in the same distance when traveling at the same speed.

2. When traveling at 20 miles an hour the stopping distance should not exceed 40 ft.

3. All brake testing should be done by experts, by machine.

4. Stopping distance cannot be accurately measured in any other way than by a deceleration meter.

5. No, it is not possible to obtain equal stopping distances with service and emergency brakes.

6. No, truck manufacturers need not provide emergency brakes at equal capacity to service brakes.—P. W. SWAN, *Manager, Calumet Baking Powder Co., Inc., Chicago, Ill.*

Better Emergency Not Needed

OUR views on brake requirements and methods of testing them follow:

1. All trucks should positively be capable of stopping in the same distance when traveling at the same speed.

2. When traveling at 20 m.p.h. a truck should stop in 30 ft.

3. In testing our truck brakes, we mark off a section of the road and measure the stopping distance in that way.

4. Yes. Truck brakes can be measured with a deceleration meter, but not as satisfactorily.

5. A truck will not stop as fast with the emergency brake as with the regular foot brakes.

6. We do not think the expense involved to make the emergency brake equal in capacity to the service brake would be worth while.—LOUIS R. LIPMAN, *Parkway Baking Co., Philadelphia, Pa.*

Should Stop in 25 Ft.

THESE are our opinions on the subject of brakes for trucks:

1. The method of stopping all trucks, irrespective of gross weight, within the same distance, is not scientifically correct, but at the present time it is the most practical method available in that it simplifies traffic regulations and their enforcement.

2. The maximum allowable stopping distance, if made equal for all trucks, should be based on safety requirements for the heavier vehicles. We believe that a stopping distance of about 25 ft. from a speed of 20 m.p.h. is reasonable and sufficient.

3. We test our truck brakes by applying the brakes at a marked point on the road and measuring the distance from the marker to the final stopping point of the truck.

4. This question is anwered under No. 3. We do not use a deceleration meter.

5. It is possible to obtain equal stopping distances with service and emergency brakes if the emergency brakes are designed to attain this purpose, but we consider this an unnecessary duplication. Our trucks are not permitted to go out unless their service brakes are in good condition. If the service brakes should fail while the truck is on the road, the driver knows the limitations of the emergency brake and will handle the truck accordingly until repairs can be made.

6. We do not believe that equal capacity in service and emergency brakes should be insisted upon.—A. J. LUBELEY, *Chief Engineer, Anheuser-Busch, Inc., Old Bridge, N. J.*

Better Hand Brakes Needed

WITH reference to the questions on brakes:

1. From a safety standpoint, it is logical to assume that all vehicles, irrespective of size and weight, should have the same deceleration rate; however, this is impractical, due to the variety of designs and the many makes and models of vehicles.

2. A well-designed passenger car having four-wheel brakes should be able to decelerate at a rate that would enable it to stop from a speed of 20 m.p.h. in approximately 18 ft. Whereas, a heavy-duty truck having two-wheel brakes will require upwards of 50 ft. to stop under same conditions, which eliminates the possibility of setting up for all types of vehicles a single requirement.

3. With some operations we use a decelerometer. However, it generally is sufficient for practical purposes to measure stopping distance along the ground.

5. It is possible to obtain equal stopping distances with both service and emergency brakes if they are designed accordingly. Present designs, however, do not offer the same capacity in the hand brake that they do in the service brake; therefore, you cannot anticipate equal stopping distances with both types.

6. I feel more attention should be paid to the emergency-brake requirement. In many cases we have resorted to special emergency-brake installations in order to increase brake capacity above that offered by the manufacturer. These conversions are expensive and many times difficult to maintain on account of dealers' inability to carry special parts.—F. L. FAULKNER, *Automobile Department, Armour & Co., Chicago, Ill.*

Next Question

Best pneumatic-tire-and-tube combination for wagons

QUESTION NO. 19

1. Do tires removed from passenger cars and trucks, because the treads are worn smooth, have sufficient protection against punctures when used with second-grade but new inner tubes for equipping horse wagons?

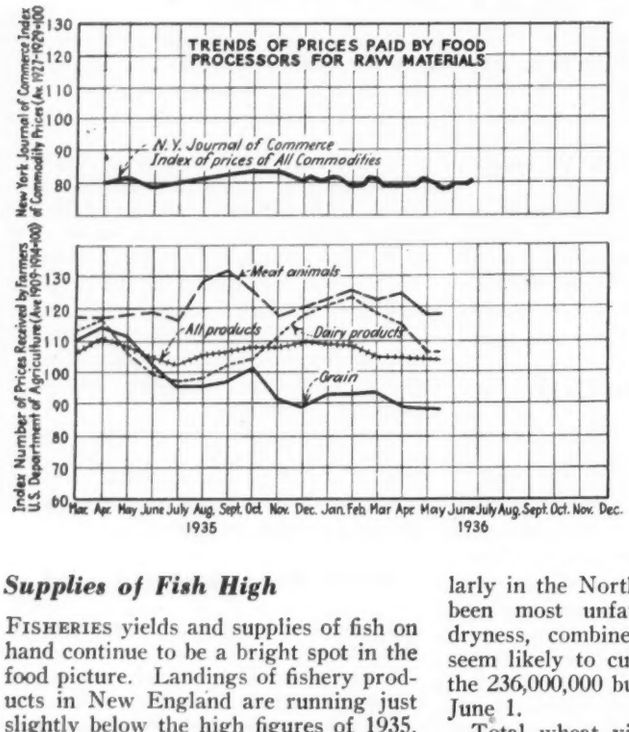
2. If not, should puncture-proof tubes or puncture sealing compounds be used with worn automotive tires?

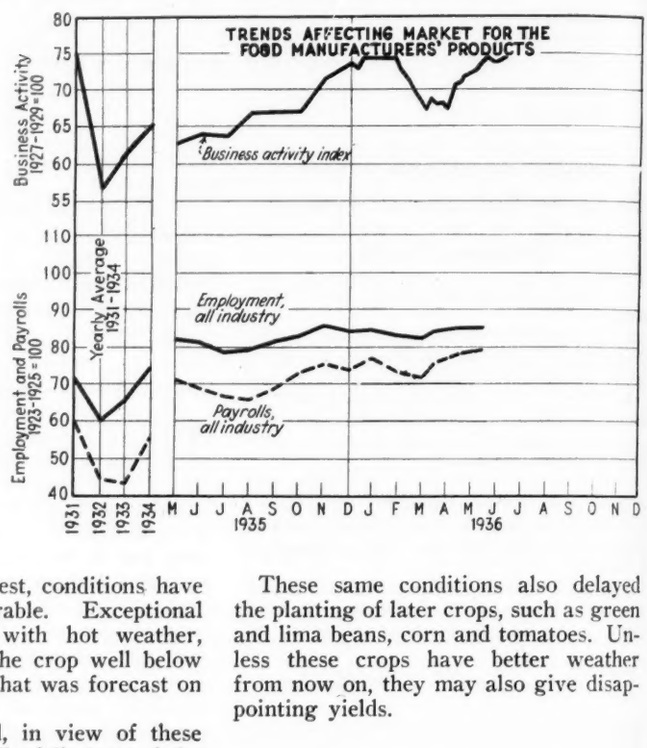
3. What is the comparative first cost of such combinations as given above with new tires and tubes?

4. Also, what is the relative freedom from punctures with the old-tire-and-tube combinations and new tires and tubes?

5. Which combination gives the lowest tire cost per mile?

BUSINESS TRENDS


TRENDS OF PRICES PAID BY FOOD PROCESSORS FOR RAW MATERIALS
New York Journal of Commerce Index of Commodity Prices (Ave. 1927-1929=100)
N. Y. Journal of Commerce Index of prices of All Commodities
Index Number of Prices Received by Farmers U.S. Department of Agriculture (Ave 1909-1914=100)
Meat animals
All products
Dairy products
Grain
Mar. Apr. May June July Aug. Sept. Oct. Nov. Dec. Jan. Feb. Mar Apr. May June July Aug. Sept. Oct. Nov. Dec.
1935
1936


TRENDS AFFECTING MARKET FOR THE FOOD MANUFACTURERS' PRODUCTS
Business Activity 1927-1929=100
Business activity index
Yearly Average 1931-1934
Employment and Payrolls 1923-1925=100
Employment, all industry
Payrolls, all industry
1931 1932 1933 1934 M J J A S O N D J F M A M J J A S O N D
1935
1936

Supplies of Fish High

FISHERIES yields and supplies of fish on hand continue to be a bright spot in the food picture. Landings of fishery products in New England are running just slightly below the high figures of 1935. Cold storage holdings of fishery products in May were 34,141,000 lb., compared to 21,774,000 lb. in 1935, and a five-year average for May of 24,376,000 lb. During the 30-day period ending May 15, 17,013,000 lb. of fishery products were frozen, compared with 9,667,000 lb. frozen in the same period of 1935.

The production of frozen fish in the United States and Alaska, for 1935, was 149,643,000 lb. This was 12 per cent above the 1934 production, 56 per cent more than 1933 production, and 62 per cent more than in 1932.

Parallel to this increase in fresh and frozen fish supplies, there is apparently a falling off in the output of canned fish. Output of canned fishery products in the U. S. and Alaska, for 1935, was 672,732,000 lb., valued at $104,480,000. This was 6 per cent below the value of the 1934 output.

Wheat Prospects Poor

IN SPITE OF the optimism that prevailed around the first of the month, 1936 wheat prospects have again been revised downward.

Rains and favorable weather in May benefited the winter wheat crop and estimates were revised upward to near the 500,000,000 bu. mark. Then in June, hot weather and insect pests threatened the crop in the Southwest and the yield will probably not be so high.

In the spring wheat areas, particularly in the Northwest, conditions have been most unfavorable. Exceptional dryness, combined with hot weather, seem likely to cut the crop well below the 236,000,000 bu. that was forecast on June 1.

Total wheat yield, in view of these facts, will undoubtedly fall short of the June 1 estimates of around 700,000,000 bu. It should, however, exceed the 603,000,000 bu. yield of 1935.

Bad Weather for Canners

SPRING, this year, was not favored with good weather. As a consequence, reports from many canning districts indicate that the early season, at least, will not be up to expectations.

Drought and cold weather delayed the pea crop in the Delaware-Maryland-Virginia area. When rains came, they were too late to do much good. Some canners in this region, around June 1, were not expecting more than 40 per cent of normal yield. Pennsylvania reports about the same condition. Wisconsin experienced unfavorable weather earlier, but conditions are now said to be better.

Construction News

	Pending (thousands)	Awarded June (thousands)	Total Awarded 1936 (thousands)
Bakery	....	....	$859
Beverages	$385	$865	3,374
Canning and Preserving	50	....	.....
Confectionery	....	....	30
Grain Mill Products	87	283	2,755
Ice Manufactured.	69	....	264
Meats and Meat Products	37	483	995
Milk Products	437	....	677
Miscellaneous	219	382	2,163
	$$1,284	2,013	$11,117

These same conditions also delayed the planting of later crops, such as green and lima beans, corn and tomatoes. Unless these crops have better weather from now on, they may also give disappointing yields.

Dairy Products Consumption

FIGURES for the annual per capita consumption of dairy products were recently brought up to date by the Bureau of Agricultural Economics, U. S. Department of Agriculture, for the years 1925 to 1934. These figures cover the continental United States, thereby differing somewhat from those previously published.

Year	Butter* (lb.)	Cheese** (lb.)	Evaporated Milk*** (lb.)	Condensed Milk*** (lb.)	Milk Used in Cities and Villages (gal.)†	Milk Equiv. of all products†† (gal.)
1925	17.7	4.7	11.1	2.6	38.9	92.1
1926	17.5	4.7	11.5	2.8	39.3	94.6
1927	17.5	4.5	11.5	2.6	39.7	94.4
1928	17.2	4.4	12.4	2.5	39.8	94.2
1929	17.4	4.6	13.7	2.7	40.8	94.3
1930	17.3	4.6	13.6	2.7	40.7	94.8
1931	18.0	4.5	13.6	2.3	40.0	96.7
1932	18.1	4.4	14.3	1.8	40.0	95.3
1933	17.6	4.5	14.1	1.7	38.8	92.7
1934	18.0	4.8	15.4	1.7	37.7	92.6

*Butter includes both farm and factory made. Also includes some butter used in other products, as ice cream.

**Includes all cheese except cottage, pot and bakers.

***Includes some condensed and evaporated milk used in other products, also includes both whole and skim milk product. Not corrected for unclassified imports.

†Milk and the milk equivalent of cream consumed per capita by that part of the population not on rural farms. These estimates include some milk and cream used in such products as ice cream and supersede estimates previously issued.

††Based on estimates of milk production on farms and elsewhere, with milk fed to calves deducted in calculating per capita consumption.

Sources: Consumption of butter, cheese, evaporated milk, condensed milk, and milk equivalent of all dairy products is calculated from production, foreign

Business Continues Gain

GENERAL business activity continues its upward climb and sets a new peak for the year. As indicated by the Business Week index it has reached 74.7 per cent of "normal"; an advance of 0.67 per cent for the month ending June 20. This is an improvement of 16.54 for the year. Steel mills are busy on orders which will keep them going at least into July. Carloadings, electric power consumption, textile production, and automobile manufacture are going strong. Even commodity prices have started to climb. Late frosts and drought conditions have affected the supply of canning crops throughout the country. Latest developments indicate a very low crop in the spring wheat area where drought persists.

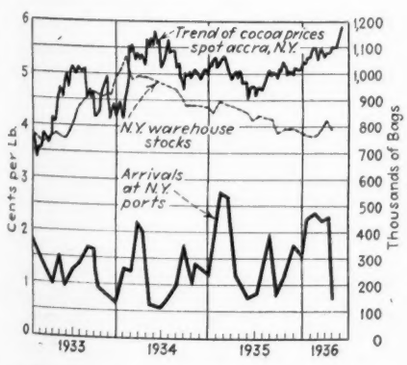
U. S. Department of Labor reports a price rise of 0.64 per cent for all commodities during the month ending June 20. Farm products jumped 3.20 per cent and food 2.84 per cent. The weighted prices compiled by the New York *Journal of Commerce* for the month ending June 27 show even greater advance. The general index is up 1.91 per cent. Those for grain shot up 9.51 per cent with those for foods going to a 4.40 per cent higher level.

trade and domestic stocks. Milk used in cities and villages is calculated from board of health reports.

Sugar Consumption Lower

SUGAR DELIVERIES in the United States, Jan. 1 to June 1, 1936, show some falling off, according to Lamborn & Co. The total amount distributed was 2,532,263 long tons, raw value, i.e., raw basis, down 1.4 per cent below the corresponding period in 1935.

Exports have also fallen off, according to the same authority. For the first four months of 1936, the United States exported 15,099 long tons of sugar, which was 52 per cent less than the sugar exported in the first four months of last year.



Prices received by farmers are from the U. S. Department of Agriculture. Employment, payrolls, wholesale prices and retail prices from the U. S. Department of Labor. The business activity index is that of *The Business Week*. The cost of living index is from the National Industrial Conference Board. Data concerning cocoa beans is from the New York Journal of Commerce.

European sugar consumption continues high. Lamborn & Co. reports the amount used by the fourteen principal European countries, September, 1935, through April, 1936, as 5,052,944 long tons, raw value. This is 3.4 per cent over the consumption for the same period of the previous crop year.

Confectionery Sales Off

FOLLOWING the trend shown by sugar consumption, confectionery and competitive chocolate sales were somewhat lower in May, 1936, than in May, 1935. The total was reported by the U. S. Department of Commerce at $14,240,763 compared to $15,796,708. This drop is said to be partly accounted for by the seasonally large volume of sales made in May, 1935.

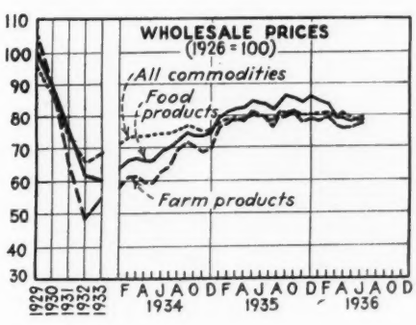
Sales of these products in April, 1936, totaled $18,422,314, compared to $17,572,711 for April, 1935, an increase of 4.8 per cent. Sales in 1935 were about 10 per cent over 1934. It seems likely, from these figures, that the sales recorded for May do not indicate a reversal in the trend, but are the result of temporary influences.

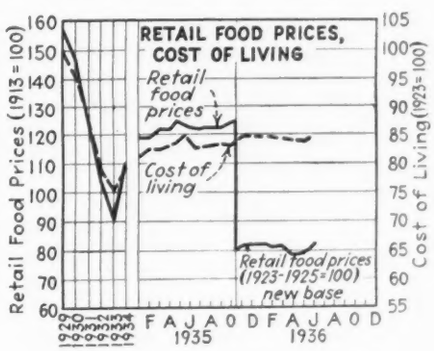
Meats Hold Steady

TENDENCIES evident in the meat packing field, as noted in FOOD INDUSTRIES for May, still continue in effect. Receipts of hogs continue to run at low levels and will do so until next fall. Meanwhile, there has been some additional decline in retail pork prices, influenced by greater consumer interest in the lower prices of beef.

Beef cattle are coming to market in somewhat greater numbers than was the case two months ago. Decline in retail beef prices has reached some 30 per cent for the better grades, as compared to a year ago. This reduction has finally been sufficient to attract consumer buying to the higher-priced cuts. Consequently, the lower-priced cuts have also become cheaper.

Lamb supply has been short during the late spring, and, as a result, lamb prices have been running higher. An increase in the supply, with somewhat lower prices, is expected in the immediate future.





Indicators

OLEOMARGARINE PRODUCTION, first four months of 1936, equaled 140,070,282 lb., down 5.8 per cent below the production for the same four months of 1935.

BUTTER PRODUCTION, first four months of 1936, equaled 469,277,000 lb., up 4.43 per cent over the production for the same four months of 1935.

BUTTER HELD in cold storage, June 1, 1936, totaled 21,075,000 lb., compared to 33,096,000 lb. on the same date of the preceding year.

COFFEE PRODUCTION, crop year 1935-36, is estimated by the New York Coffee and Sugar Exchange at 30,803,000 bags, an increase of 23 per cent.

COCOA BEAN IMPORTS, first five months of 1936, are reported by Marcone & Co., at 1,950,132 bags, about 10,000 bags over the imports for the same five months of 1935.

APPLE CROP PROSPECTS for 1936, reported as of June 1, were 46.7 per cent of normal, compared to 71.3 per cent the previous year, and a five-year average of 67.8 per cent.

WALNUT PRODUCTION of 907,200 bags (100 lb. each) in 1935 was recently reported by California Walnut Growers Association, 844,880 bags being produced by California growers.

CROP PROSPECTS are being adversely affected by the weather in almost all parts of the country, according to a mid-June summary published in the New York *Journal of Commerce*.

MEAT IN COLD STORAGE, June 1, 1936, was 549,891,000 lb. for all kinds compared to 626,803,000 lb. on the same date in 1935, and a five-year average of 794,014,000 lb.

POULTRY AND EGG PRODUCTION has increased, with 12 per cent more chicks and young chickens in farm flocks on June 1, and egg output up 5 per cent, from a year ago.

Keeping Up With the Field

Legislation—Standards—Trade Troubles—Investigations —Court Decisions—New Methods

Windfall. Many food manufacturers who have survived financially only because the Supreme Court decided that processing taxes were illegal have a rather dismal outlook. All of which comes about through that provision in the Revenue Act of 1936 which imposes a tax of 80 per cent upon the "windfall" or "unjust enrichment" arising from processing taxes refunded by court order. Other provisions of this act levy corporation-income and undistributed-profits taxes sufficiently complex to require interpretation by a legal counselor.

Paper-Bottle Victory. Dairies using paper milk containers are one up on competitors in the battle on the bottle front. This was brought about by the decision of New York's Supreme Court Justice Cotillo in the suit brought by the Borden subsidiary, Dairy Sealed, Inc. Justice Cotillo upheld the right of the dairy to sell milk in paper containers at the same price as milk in glass, and not one cent higher, as New York State Milk Control Division had ordered. He refused to agree with the contention that milk in paper costs more to produce, and he felt that the interests of consumers should be considered.

Candy-Coated Wisdom. So broadly significant were the problems discussed at the annual convention of National Confectioners' Association last month that they might well apply to the business of almost any food manufacturer. Speaking at this New York meeting, Arthur D. Whiteside, Dun & Bradstreet, wisely pointed out that all members of industry must take a more personal interest in industry affairs and help work out a policy which complies with present-day business trends. Otherwise, federal agencies will be laying down more stringent rules and regulations.

Obvious, but too often overlooked, is a fact stressed by W. E. Brock, Brock Candy Co. He reminded the candy manufacturers that they had to meet the competition of ice cream, soft drinks and pastries more than the competition of each other. He made the further point that consumers must be educated to regard candy as a wholesome and nutritious food.

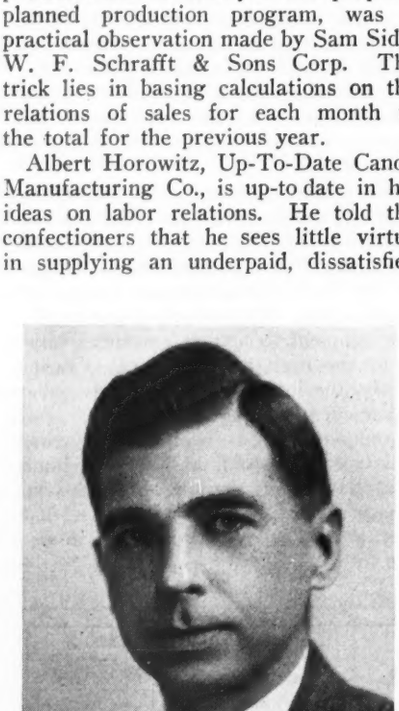
The need for accurate, adequate and timely sales statistics represents a basic problem of the confectionery industry. This was brought out by C. E. Birgfeld, Department of Commerce, in a report on "Changes and Trends in Candy Distribution." Mr. Birgfeld also revealed that today the wholesale jobber handles three-fourths of the candy business, while ten years ago he did only half of it.

Making a profit, and not moving a volume of goods at prices in line with the market regardless of cost, ought to be considered as the job of the sales manager. These were words of wisdom dropped by Harry R. Chapman, New England Confectionery Co. And mental sparks were struck by Ira W. Minter, Minter Bros., when he said that the future of the small manufacturer lies in limiting his sales territory to within a 24-hour-transportation distance, in restricting the number of items produced and in maintaining a factory which will yield a high production-volume in proportion to its size.

What the sales on any particular item will be during any given month can be predicted almost exactly with a properly planned production program, was a practical observation made by Sam Sidd, W. F. Schrafft & Sons Corp. The trick lies in basing calculations on the relations of sales for each month to the total for the previous year.

Albert Horowitz, Up-To-Date Candy Manufacturing Co., is up-to date in his ideas on labor relations. He told the confectioners that he sees little virtue in supplying an underpaid, dissatisfied and inexperienced worker with expensive, high-quality materials. He considers the hours and wages of the NRA candy code not only equitable, but desirable.

During two afternoons of the convention, plant men discussed their problems in a production forum. The interest in these discussions was so encouraging that members voted to hold the forum again next year.



HARRY D. LIGGITT
First choice of A.A.C.C.

Cereal Problems. That the public demands freshly baked bread and bread made from a rich formula was indicated in a report by Florence B. King, Department of Agriculture, at the convention of American Association of Cereal Chemists, in Dallas. This agrees with the results of a study made by the New York section of A.A.C.C. among its own members.

Evidence presented at the meeting by Dr. C. N. Frey and coworkers at Fleischmann Laboratories showed that such weakly ionized acids as acetic, even as found in vinegar, prevent the growth of molds in bread. The value of approaching bakery problems from both the laboratory and bakeshop points of view was brought out by reports on studies dealing with flours, other cake and bread ingredients and baking technique. Some 40 reports were made on such studies, some of which tie in closely with work sponsored by American Society of Bakery Engineers.

New varieties of wheat are being developed faster than old ones are discarded, even though the new ones are given long and thorough tests before being recommended for crop growing. That was revealed by Dr. K. S. Quisenberry, Department of Agriculture, who acquainted the chemists with methods used in selecting, breeding and testing new varieties of wheat.

The next meeting of A.A.C.C. will be in Minneapolis, probably the first week in June, 1937. The new president is Harry D. Liggitt, Colorado Mill & Elevator Co., Denver.

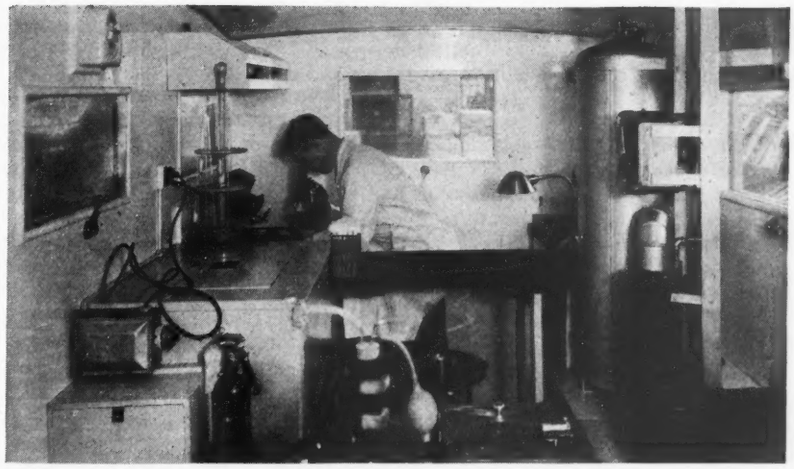
Down, Not Out. After three years of wandering in the legislative labyrinth in Washington, the Food and Drug Bill again came to a dead-end alley when Congress departed last month. But as before, defeat is not final. When the law makers come in from the hinterlands in January, the bill again will take up its wanderings, with some prospect of

finding its way early to the Presidential desk. Always a point of heated controversy, the provision, agreed upon in the Senate-House conference, of splitting control of advertising between the Department of Agriculture and the Federal Trade Commission proved the final stumbling block. But there will be other arguments in January, particularly over labeling provisions and over enforcement clauses which the Administration considers too toothless.

Little NRA. Prevented by the Supreme Court from legally regulating working conditions in industry generally, the Administration will be able to do so wherever Federal money is involved. Such is the effect of the Walsh-Healey bill governing working conditions in fulfillment of government contracts. Business men, however, should be thankful for the mildness of the measure as compared with the original bill. Limited to contracts over $10,000, the bill exempts purchases "such as may usually be bought in the open market," perishables and agricultural products. For those remaining within its scope the requirements include: Payment of prevailing wages; 40-hour week; no convict labor nor male workers under 16 or females under 18; compliance with state safety, sanitary and factory-inspection laws.

Sugar Stop-Gap. Now that the O'Mahoney resolution has come to the rescue, sugar quotas and their stabilizing influence on the trade will be protected until Congress can find time to revise the Jones-Costigan Act next January. Senator Overton's bill is considered the permanent sugar legislation to be enacted in the future, but meanwhile the present quotas remain in force for two years. However, there is no authority for direct benefit payments to sugar producers because the $30,000,000 appropriation for that was eliminated from the O'Mahoney resolution.

Milk Muddles. Reports of the milk-market investigations of the Federal Trade Commission present a sorry picture of price conditions and relations between producers and distributors in the milk sheds of Boston, Cincinnati, St. Louis and Minneapolis-St. Paul. But there is at least one city in which everything is rosy, Baltimore. To quote the FTC report: "The history of the Baltimore milk market is one of peace and quiet as compared with most of the metropolitan markets. . . . In that market, the importance of maintaining proper relationships between class and blended prices has been fully recognized." In Boston, conditions have long been unstable. In Cincinnati, the history of the market is one of conflict between producers and distributors. St. Louis has a large surplus problem, and Minneapolis-St. Paul suffered severely from price wars. Distributor reports and adequate audits of milk utilization are considered essential to a happy solution of milk-market troubles.



TOURING LABORATORY

Two light trucks which the Department of Agriculture has converted to Swiss-cheese laboratories will assist cheese makers in Wisconsin and Ohio to maintain closer control over scientific processes. If, for example, there should be trouble with bacteria cultures, they can be examined readily

Resolve to Profit. Loss-leader selling has become such a thorn in the flesh of food processors that they have decided to do something about it, if possible. In addition to backing the Robinson-Patman bill "in principle," Associated Grocery Manufacturers of America has resolved to restrict "below-cost selling . . . in so far as legally possible through remedial action . . . and to develop selling policies assuring distributors of adequate profit margins."

Aid to Fisheries. Enlargement of the Bureau of Fisheries to include an economic research division to collect and study information on "fishery methods and on the catching, production, preservation, marketing and utilization of fishery products" is the most significant provision of the Bland bill (H.R. 8055). But the measure also authorizes creation of a market news service, and it may set up an extension service for spreading information about fish products and fishery methods.

Boost for Wine. Much to the dislike of importers, the new liquor revenue bill will help domestic vintners to continue the skyrocket rise in business which gave them 80 per cent more volume last year over 1934. This is true not only because the measure appreciably lowers the tax rate on some domestic wines and "light" drinks, but because it permits the use on labels of such names as Port, Sherry, Burgundy, Sauterne, Chianti, Chablis and what not. It is unfortunate that "Champagne" was striken from the list on the ground that the American product, processed by the "tank" method, is inferior to the French.

Baby Beans. Terms used on the labels of food products mean what consumers think they mean and not what the manufacturer says they mean. So rules the Food and Drug Administration. Therefore, a consumer survey having revealed that such terms as "Baby," "Tiny," "Midget" and the like on canned lima beans are taken to connote a young, tender, green bean, that's the way those terms must be used. And anything else is misbranding. But since the expression, "Baby Lima Beans," has a well-recognized varietal significance, it will be tolerated provided the term "Baby" is qualified.

Containers on Test. Shippers of perishables are watching with considerable interest the results of fruit packaging experiments by shippers of Minnesota. Different types of packages have been tried out, but the old bushel basket, long favorite with the apple shippers of the state, still holds its own. The use of ring packing forms for higher grade fruit is winning the approval of many, however.

The well known Hallock type box for strawberries has managed to beat down opposition. Tests of paper-board boxes were made, but the shippers reported small advantage and some disadvantage compared with the wood-veneer container. Transparent wrappings for raspberries and strawberries have been tried,

Conventions

JULY

10—National Kraut Packers Association, Hotel Rieger, Sandusky, Ohio.
13-15—National Confectionery Salesmen's Association of America, Hotel Statler, Boston.

AUGUST

12-15—National Food Distributors' Association, Hotel Statler, Boston.

but have not met with any degree of favor. There has been no noticeable effect on the keeping qualities of the fruit.

Tough. Bacteria, yeasts and molds can survive death by freezing for as long as three years at a temperature as low as 15 deg. F., experiments by Bureau of Plant Industry have revealed. Furthermore, some will grow in cold storage, and others will multiply rapidly at room temperature after being under refrigeration for a year. So, fruits and vegetables should be clean and free of decayed spots before freezing, the bacteriologists say.

Changing Standards. Even the Food and Drug Administration can change its mind, as is proven by the issuance June 19 of revised standards for canned peas which are to supersede revised standards promulgated May 8. To take effect in 90 days, the new standard of quality and condition reads: "Standard canned peas are the normally flavored and normally colored canned food consisting of the immature, unbroken seed of the common or garden pea, with or without seasoning, and with or without added potable water. The product is practically free from foreign material and, in the case of products containing added liquid, the liquor present is reasonably clear." All of which means nothing without a detailed explanation of the terms used, which may be had from F&DA.

Cleaner Crabmeat. What with the Food and Drug Administration's campaign for clean crabmeat having resulted in the seizure of 5,700 lb. of polluted seafood during May, the action of the House in appropriating $40,000 to pay the salaries of inspectors for seafood plants might be said to be highly appropriate. Heretofore, the fees charged for such inspection have been a little steep for many small packers, and with the new appropriation, these charges likely will be cut in half.

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Concentrates

• Trade practice rules similar to those embodied in the NRA code are sought for the preserving industry by National Preservers' Association. Three hearings on the rules were held last month by the Federal Trade Commission.

• *National Macaroni Manufacturers' Association adopted resolutions urging improvement in quality standards after hearing at the annual convention that inferior products were undermining the industry.*

• The Federal Trade Commission has charged Hoffman Beverage Co., Newark, with disparaging the products of a competitor by advertising that: "The vat-fresh taste of Hoffman bottled beer is due to the fact that Hoffman beer is not heat-treated after bottling. . . ."

• *Macadamia, a new nut grown in the Hawaiian Islands, is now being commercialized. It is a round, smooth, white nut of medium size and is high in oil content.*

• National-American Wholesale Grocers' Association has submitted to the canning industry recommendations for improved minimum specifications for solid and corrugated fiber-board boxes. This action followed a study of losses sustained by jobbers through dented cans and damaged labels.

• *Left-wing elements in the State of Washington are seeking legislation to put the State in the food manufacturing and distributing business. A "production for use" move, it is said to have strong support.*

• Both General Foods Corp. and Best Foods, Inc., are giving factory employees from one to two weeks' vacations with pay this summer.

• *Air is no adulterant, the Supreme Court in the State of Washington has ruled. And "balloon" bread is permissible even though a one-pound loaf measures 12 in. instead of the usual 9 in.*

Men . . . Jobs . . . and Companies

Industry

• Armour & Co., Chicago, will develop a special class of trade for the fine-grained meat from the peanut-fed pork of the South. Armour is reopening its Greenville, Miss., branch, and it has purchased Memphis Cotton Oil Mill which it will remodel and reequip at a cost of $100,000. The company recently opened its new $1,500,000 beef house in Chicago.

• Canada Dry Ginger Ale, Inc., will open a new warehouse at Birmingham, and will deliver directly to retail outlets.

• Consolidated Biscuit Co., recently formed through the merger of the Davidson Biscuit Co., Chicago, and Hampton Cracker Co., Louisville, has now merged with Thinshell Products, Inc., Chicago. The combination is said to be the fourth largest concern of its kind.

• Cudahy Packing Co. will erect a $500,000 plant at Albany, Ga., to take advantage of the growth of the livestock industry in the Southeast. To have a capacity of 8,000 hogs, 1,000 head of cattle and 500 calves weekly, the plant will be built with walls of glass brick.

• Adolf Gobel, Inc., New York, has contracted for exclusive use in its territory of Angostura Bitters as a flavoring agent in sausages.

• Kraft-Phenix Cheese Corp. will establish a company in Argentina and a number of cheese plants in rural England. A new sales campaign in the Orient also is planned.

• National Biscuit Co. has quit production at its plants in Omaha, Mansfield (Ohio), Indianapolis and St. Joseph (Mo.). Production will be concentrated in more modern plants in other cities.

• Punxsutawney (Pa.) Beef & Provision Co. will build a $150,000 packing plant.

• Purity Biscuit Co. will spend about $200,000 to triple the production of its plant in Salt Lake City.

• Joseph Schlitz Brewing Co., Milwaukee, is erecting facilities at a cost of $400,000 to increase its malting capacity by 1,000,000 bu.

• South Mississippi Ice Co., Pascagula, Miss., plans to quick-freeze shrimp.

• Stokely Bros. Co., Indianapolis, has purchased the W. H. Pride Co. plant at Bellingham, Wash.

• Swift & Co. has added Graves Ice Cream Co., Louisville, to its chain of ice cream plants.

• Daniel D. Weschler & Sons Co., Milwaukee, will make additions to its malt house and grain elevators at a cost of $200,000.

• Wilson & Co., Chicago, recently took over J. T. McMillan Packing Co., St. Paul, and is installing its own management.

MEAT PACKING CANNING BAKING FOOD
CONFECTIONERY DAIRY BEVERAGE ICE CREAM
FLOUR & GRAIN PRODUCT PLANTS

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Oakite Cleaning

TO MAINTAIN HIGH SANITATION STANDARDS

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Wherever product quality, goodness and flavor are dependent on the maintenance of high sanitary standards you will find Oakite materials providing the PROTECTION and the FIRST LINE OF DEFENSE against dirt, film, bacteria, spores and mold growth . . . doing it effectively and at low cost.

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A remarkable NEW development in chlorine sterilization

For sterilizing equipment, utensils and general disinfecting of floors, walls, rooms . . . clean first . . . then spray or flush with OAKITE BACTERICIDE. Completely soluble, instantly ready for use, its greater bacteria destroying power assures a wider margin of safety than sanitary regulations prescribe. Write for interesting booklet . . . FREE on request. No obligation, of course.

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SPECIALIZED INDUSTRIAL CLEANING MATERIALS & METHODS

Personnel

• GEORGE M. ARMOR, McCormick & Co., heads up Flavoring Extract Manufacturers Association of the United States for the coming year.

• M. J. BLISH has been awarded the Thomas Burr Osborne medal for his work in cereal chemistry. He is with Nebraska Agricultural Experiment Station.

• R. T. BOHN has been transferred from the Minneapolis office of Great Atlantic & Pacific Tea Co. to the newly formed National Bread division in New York.

• J. L. BUCKNER, Argo plant manager for Corn Products Refining Co., has been transferred to New York as head of all domestic plants. W. T. Brady, manager of the Edgewater plant, has gone to Chicago to succeed Mr. Buckner.

• ELMER E. CHASE, Richmond-Chase Co., San Jose, Calif., has again been chosen president of Canners' League of California.

• V. C. CLARK, Tyrrell Rice mill, Beaumont, Tex., has been elected president of Rice Millers' Association.

• W. J. FAIRFAX has been named by Armour & Co. as head of the canned foods production department at Chicago, succeeding the late George R. Mawer.

• GEORGE GORDON now is superintendent of the Vinton plant of Iowa Canning Co.

• J. P. GORMAN has become plant manager for Armour & Co. at Chicago.

• JOHN A. W. HARTUNG, for 22 years with Ruppert Brewery, New York, has been appointed superintendent of the new plant of Koppitz-Melchers Brewing Co., Detroit.

• ARTHUR M. HARTWELL and Walter R. Barry, Minneapolis, and L. N. Perrin, Chicago, have been made vice-presidents of General Mills, Inc., Minneapolis. Walter Mills, Minneapolis, becomes a member of the operating board.

• ALBERT F. HUNT recently was named vice-president of Swift & Co., Chicago, and will be over general plant operations, laboratories, research activities and construction work.

H. W. Jeffers

• HENRY W. JEFFERS, president of Borden-Walker-Gordon Laboratory Co., Plainsboro, N. J., has been elected president of Certified Milk Producers' Association of America.

• L. CHARLES MAZZOLA, formerly president of Geneseo Jam Kitchen, has been appointed general manager of the new preserving department of Ivanhoe Foods, Inc., Auburn, N. Y.

• MORRIS W. MEAD, JR., has gone with National Grain Yeast Corp., Belleville, N. J., as research chemist. He had been at Mellon Institute on a fellowship of the company.

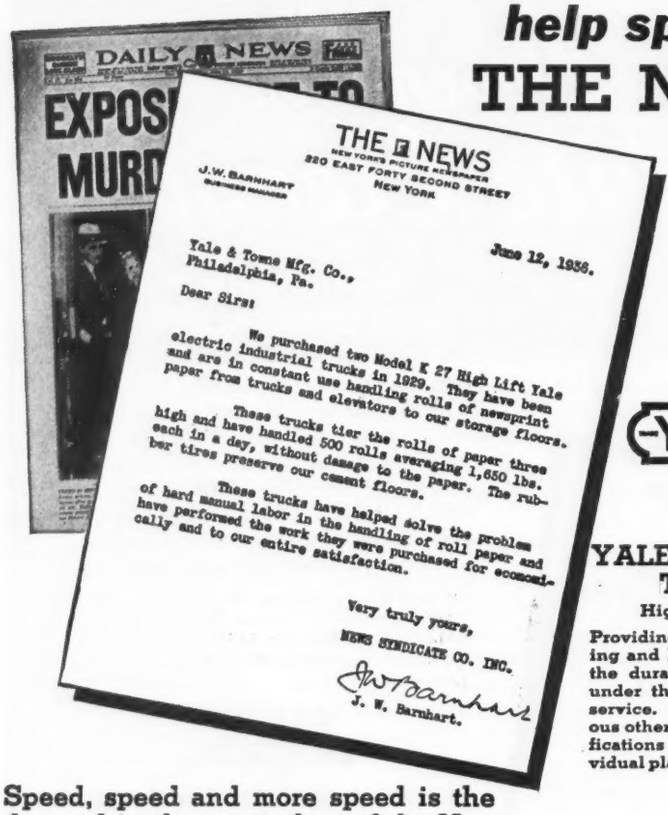
• EUGENE MEYER succeeds the late Nicholas Wolter as president of Illinois Packing Co., Chicago. H. J. Cramer becomes vice-president and Charles Loefler, treasurer.

• O. W. MILLER, president of Lee Baking Co., Atlanta, heads up Southern Bakers' Association.

• PAUL NEUBAUER now is president of Iowa Bakers' Association.

• M. E. PARKER has left Sealtest System Laboratories to take charge of production development and quality maintenance for Beatrice Creamery Co., Chicago.

YALE TRUCKS
help speed up THE NEWS


DAILY NEWS
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NEW YORK
J.W. BARNHART
June 12, 1936.
Yale & Towne Mfg. Co.,
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These trucks tier the rolls of paper three high and have handled 500 rolls averaging 1,650 lbs. each in a day, without damage to the paper. The rubber tires preserve our cement floors.
These trucks have helped solve the problem of hard manual labor in the handling of roll paper and have performed the work they were purchased for economically and to our entire satisfaction.
Very truly yours,
NEWS SYNDICATE CO. INC.
J. W. Barnhart.

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YALE ELECTRIC TRUCK
High Lift Model

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Speed, speed and more speed is the demand in the great plant of the New York Daily News where more than a million and a half copies of The News are printed and distributed daily and nearly three million on Sunday. The letter reproduced above shows that YALE Trucks are meeting that demand. They provide, not speed alone, but the important added factors of efficiency, economy and safety.

A Materials Handling Survey of your plant by a YALE Expert is yours for the asking. No obligation.

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Philadelphia Division, Philadelphia, Pa., U.S.A.

• WILLIAM H. RITTER, JR., succeeds E. W. Mills, retired, as general manager and treasurer of P. J. Ritter Co., Bridgeton, N. J.

• HAROLD E. RUE and Raymond N. Bostock, former chief engineer and process engineer, respectively, of Hoffman Beverage Co., have set themselves up as consulting engineers, with offices in Newark, N. J.

• OSCAR STOUT has resigned as production head for Sweets Co. of America to become production manager for Brock Candy Co., Chattanooga, Tenn.

• ELMER A. WHITEMAN, Washburn Crosby Co., Inc., Buffalo, has been elected president of Association of Operative Millers.

• GUS WINCKELMANN, formerly in charge of production with Best Foods, Inc., now is with Frankfort Distilleries, Inc., Baltimore.

B. J. Zenlea

• BENJAMIN J. ZENLEA, for the past eighteen years with Rockwood & Co., Brooklyn, is now chief chemist of Walter Baker & Co., Dorchester, Mass., chocolate firm.

Deaths

• JAMES G. COWNIE, 76, until his retirement on May 1 export manager of Jacob Dold Packing Co., Buffalo, June 1.

• LEON HOINOWSKI, 52, for thirteen years president of Broadway Milling Co., Buffalo, June 10.

• MATHIAS KNECHT, 83, founder of Knecht Milling Co., June 2, at Hartford City, Ind.

• RUDY B. LENGACHER, 54, manager of the Wittenwyler & Burgy cheese factory, Monticello, Wis., May 27.

• WALTER A. SCHENK, 62, secretary and general manager of Prairie River Creamery Co., Gleason, Wis., May 26.

• JACOB R. SHREVE, 68, president of Brandt Co., Cleveland, May 31.

• EDWARD O. SHUSTER, 70, secretary of Curtice Bros. Co., Rochester, N. Y.

• ALBERT R. SINGLER, 75, who for 51 years operated Kanzler Bakery, Sandusky, Ohio, May 20.

• HARRY W. STEGALL, 62, president of Union Biscuit Co., St. Louis, June 10.

• CHARLES P. WOLVERTON, 68, vice-president of Maritime Milling Co., Buffalo.

• C. H. WORTZ, 72, president and founder of Wortz Biscuit Co., Fort Smith, Ark.

Associated Industries

• GEORGE C. ANDERSON, manager of the Chicago sales branch of Creamery Package Manufacturing Co., died recently.

• ARMSTRONG CORK PRODUCTS CO., Lancaster, Pa., will act as sales agent in the equipment installation field for the glass-wool insulation of Corning Glass Works.

• EDWARD ERMOLD, founder of the labeling machine company bearing his name, died recently.

• OWENS-ILLINOIS CAN CO., recently organized by Owens-Illinois Glass Co., has taken over St. Louis Can Co.

• REPUBLIC STEEL CORP., Cleveland, announces that Julius Kahn has become vice-president in charge of product development. Mr. Kahn had been president of Truscon Steel Corp. for 33 years.

HAVE YOU A COXSWAIN *in your CLEANER?*

IN YOUR cleaner too, power without control is like a crew without a coxswain. For efficient cleaning you need both active cleaning energy and safety control. That's why the food industries are switching to Metso, pure sodium metasilicate*.

Metso's high powered alkalinity quickly removes grease, oil and dirt of all sorts, and then a balanced silica content inhibits corrosive action on sensitive surfaces.

In bottle washing, can washing, equipment cleaning, floor cleaning, laundering uniforms, Metso will make worth while dollar and cents savings.

When can we demonstrate the twin cleaning action of Metso?

PHILADELPHIA QUARTZ COMPANY

EST. 1831

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*U. S. Pat. 1898707

METSO

METSO CLEANERS

PATENTS

Shucking of Oysters and Clams Aided Through Chemical Treatment to Relax Muscular Tension of the Bivalve on Its Shell—Herbert F. Prytherch and Vera Koering, Beauford, N. C. No. 2,041,727. May 26, 1936.

Butter Color in Dry Form Made From Aniline Dye and Dried Milk—Adino F. Files, Maumee, Ohio. No. 2,042,173. May 26, 1936.

Color and Flavoring for Gelatin Dessert Mixture Impregnated in Sugar Cubes Coated With Sugar Glaze to Prevent Loss of Volatiles—Alvin H. Blount, Los Angeles, Calif., to Jell-Well Dessert Co., Ltd., Vernon, Calif. No. 2,042,581. June 2, 1936.

Vacuum Packed Canned Foods Given Angular Reciprocated Agitation During Pasteurization and Cooling—Henry C. Stephens, Balboa, and Stedman B. Hoar, Orange, Calif., to Natural Food Products Co. Nos. 2,042,685 and 2,042,686. June 2, 1936.

Sugar Recovered From Solution by Liming in a Continuous Manner—Sherman Chase Meredith, San Mateo, Paul Warren Alston, Berkeley, Edward Tabor Winslow, Saratoga, and Clarence White, San Francisco, to Spreckles Sugar Co., San Francisco, Calif. No. 2,042,724. June 2, 1936.

Mixed Fatty Acids Separated Through Conversion to Nitriles, Fractional Distillation, and Conversion Back to Individual Fatty Acids—Anderson W. Ralston, William O. Pool, and James Harwood to Armour & Co., Chicago, Ill. No. 2,042,729. June 2, 1936.

Skinless Sausages Prepared by Molding Meat Mixture, Exposing Surface to Atmosphere, Smoking, and Returning to Molds for Thorough Cooking—Charles H. Vogt, to Modern Food Process Co., Philadelphia, Pa. No. 2,043,132. June 2, 1936.

Baked Products for Diabetics Prepared From Mixture of Defatted Grain Germs, Yeast, Acids and Water—Earl Wille and Eugen Fritsch to Rosing-Muhlen Aktiengesellschaft, Duisburg, Germany. No. 2,043,139. June 2, 1936.

Egg Meats Forced Under Pressure, Without Contact With Air, Through Cutting Surfaces to Break-up Membranous Content—Orville E. Droege to Industrial Patents Corp., Chicago, Ill. No. 2,043,372. June 9, 1936.

Meat Tenderized by Pumping a Dilute Solution of Proteolytic Enzymes Through Vascular System—Levi Scott Paddock and Cleo A. Rinehart to Industrial Patents Corp., Chicago, Ill. No. 2,043,392. June 9, 1936.

Coffee Roasted in Sealed Containers Ready For Market—George L. N. Meyer, Milwaukee, Wis. No. 2,043,443. June 9, 1936.

Wine and Vinegar Clarified by Agitating With Bentonite—Lawrence G. Saywell, Berkeley, Calif. No. 2,043,713. June 9, 1936.

Hard Candy Lozenges And the Like Wrapped With a Layer of Unwaxed Paper, Layer of Waxed Paper, and Foil Outer Wrap and Sealed by the Wax on the Waxed Paper—Donald R. Grant, Canajoharie, and Edward J. Hambrecht, Palatine Bridge, N. Y., to Beech-Nut Packing Co., Canajoharie, N. Y. Nos. 2,043,829 and 2,043,830. June 9, 1936.

Fibrous Food Containers Given a Non-Porous Coating by Applying Wax Emulsions—Harold A. Levey, New Orleans, La. No. 2,043,897. June 9, 1936.

Yeast Grown in Large Volume of Nutrient Aerated by Small Volume of Air With Expenditure of Small Amount of Power—Emile van Theil, Compiegne, France, to Naamlooze Vennottschap Industriele Maatschappij, Voorheen Noury and van der Lande, Deventer, Netherlands. No. 2,043,940. June 9, 1936.

Ice Cream Bars Hardened During Passage Through Refrigerating Chamber on Endless Conveyor—Clarence W. Vogt, to Vogt Processes, Inc., Louisville, Ky. No. 2,044,032. June 16, 1936.

Fermentable Food Products Preserved in Small Fabric Containers Stacked in Barrels Filled With Preserving Liquid—Ross C. Irons, Bellevue, Ohio. No. 2,044,245. June 16, 1936.

Casein Having a pH 4.63 to 4.67 and 6 Per Cent or Less Moisture Made in a Continuous Manner—Forest H. Clickner to Kraft-Phenix Cheese Corp., Chicago, Ill. No. 2,044,282. June 16, 1936.

Coconuts Pared Mechanically—Secondo L. Casella to Franklin Baker Co., New York, N. Y. No. 2,044,418. June 16, 1936.

Cereals and Podded Grains Mechanically Hulled and Polished—Leopold Kaspar, Sr., Olmutz, Czechoslovakia and Nicholaus Kistner, Offenbach, Germany, to Kaspar Getreideschalmaschine G.m.b.H., Offenbach, Germany. No. 2,044,531. June 16, 1936.

Nutmeats Subjected to High Vacuum, Treated With Inert Gas, and Subsequently Packed in Oxygen-free Atmosphere in Metal Containers—Julius L. Schmeider, Chicago, Ill., to Continental Can Co., Inc., New York, N. Y. No. 2,044,639. June 16, 1936.

Chewing Gum Formed Under Pressure in Molds on Continuous Conveyor—Conrad E. Peterson, Malden, Mass., to De Long Gum Co., South Boston, Mass. No. 2,044,748. June 16, 1936.

Books Received

WORKSHOP RECEIPTS (5 vols.) Distributed in United States by Chemical Publishing Co. of New York, Inc., 148 Lafayette St., New York, N. Y. Each volume over 500 pages. 5½x8 in. Cloth. Indexed. Price $2.50 per volume.

No one can be a specialist in every field, but often someone hopes a book will turn out to be. Requests for information on how to do and how to make all sorts of queer things come in every day and often are difficult to answer readily. These books, standard in England for some years, have just been introduced into the United States. They detail processes, formulas, methods and just plain "kinks" by the hundred, arranging them alphabetically in four volumes. The fifth is a supplement including more recent data and filling gaps in the earlier ones. If you want only one book, the supplement is the one to choose.

Subjects of interest to the food-plant operator include: acidimetry, albumen, alcohol, alkalimetry, alkaloids, baking powders, confectionery, cooking apparatus, disinfectants, drying and desiccating, emulsifying and emulsions, filtration and percolation, evaporating, freezing mixtures, hot-water apparatus, oils and fats, paints and painting, extracts and essences, preserving and protecting foods, vinegars, common names of chemicals, egg storage, spray painting, and refrigeration.

VITAMIN D ACTIVITY OF CACAO SHELLS. By Arthur William Knapp, Cadbury Bros. Ltd., Bournville, Eng. and Katherine Hope Coward Pharmacological Laboratory of the Pharmaceutical Society. Reprinted from Biochemical Journal Vol. 29. No. 12, (1935). 8 pp. 7¼x10 in. paper.

Authors discuss the origin of vitamin D in cocoa bean shells and the effect of fermenting and drying cocoa beans upon the vitamin D content of the shells.

THE BAKING INDUSTRY UNDER N.R.A. by R. W. Stone and U. B. Stone. Published by University of Chicago Press, Chicago, Ill. 1936. 106 + XIII pp., 6x9 in. paper. Price $1.

Published as a case study of a specific industry which has been investigated to determine whether the N.R.A. "Codes of Fair Competition" were setting up types of administrative control adaptable to the peculiar features of the industries they were supposed to control.

Clogged Controls

(Continued from page 340)

sure gage is located down underneath the platform where the operator cannot see it. Although the system has been installed about four years, no mishaps have ever arisen that would require special inspection. But nobody feels badly about that.

WHILE this use of a recording gage is absolutely necessary with opaque glass jars, it looks like a very good thing to have at any plant operating on clear glass, for it helps to spot operating troubles.

However, when Underwood first put in their new system, with the special recording pressure gages, they found that the pressures and temperatures did not always stay where they were supposed to stay. The mechanical department soon found out that iron rust and scale had gotten into the instruments and plugged some of the openings, particularly in the pilot valves. This happened in spite of strainers on the pipelines.

But, after cleaning out the valves and instruments the trouble came again. Then there was another clean-up. And still they clogged. Next time they decided to see where the stuff came from and took out all the piping and supports from the inside of the bottom of the retorts. There they found a hatful of scale and rust. Then they found out that most of it was coming from the inside walls of the retort and the bottom. These walls were made of bare, black steel.

The cure for this trouble was to wire-brush the walls until they were bright, then paint them with aluminum paint. It stopped all of the troubles. After six months' use, the retorts were inspected again and the walls were found to be in satisfactory condition, but the bottoms were showing signs of rust. So the bottoms were painted again. Experience has shown that the inside walls need painting once a year and inside bottoms need it every six months. And since that schedule of painting has been carried out there has been no more trouble.